HONI SOIT QUI MAL Y PENSE
DIEU ET MON DROIT

AGRICULTURAL RESEARCH INSTITUTE

PUSA

312563

TROPICAL DISEASES BULLETIN

ISSUED UNDER THE DIRECTION OF THE HONORARY MANAGING COMMITTEE OF THE TROPICAL DISEASES BUREAU.

312563
IARI

General Editor:
THE DIRECTOR OF THE BUREAU.

VOL. **20.** (Nos. 1-12.)
JANUARY—DECEMBER, 1923.

London:
TROPICAL DISEASES BUREAU,
23, Endsleigh Gardens, N.W.1.

1923.

HONORARY MANAGING COMMITTEE.

Chairman:
Sir H. J. Read, K.C.M.G., C.B.
(*who is also Chairman of the Advisory Committee of the Tropical Diseases Research Fund*).
Dr. Andrew Balfour, C.B., C.M.G.
Sir John Rose Bradford, K.C.M.G., C.B., C.B.E., F.R.S.
(*representing the Royal Society*).
Major-General Sir David Bruce, K.C.B., F.R.S.
Major-General Sir R. Havelock Charles, I.M.S., G.C.V.O, K.C.S.I.
Lieut.-General Sir William B. Leishman, K.C.M.G., C.B., F.R.S., K.H.P.
Sir John M'Fadyean, M.R.C.V.S.
Sir S. Stockman, M.R.C.V.S.
Mr. E. M. B. Ingram, O.B.E.
(*representing the Foreign Office*).
with
Mr. W. C. Hankinson, M.C.,
of the Colonial Office as Secretary.

STAFF OF THE BUREAU.

Director:
A. G. Bagshawe, C.M.G., M.B., D.P.H. Cantab.,
of the Uganda Medical Staff.
Assistant Director:
Lt.-Col. A. W. Alcock, C.I.E., F.R.S., I.M.S. (retd.).
Secretary and Librarian:
R. L. Sheppard.
Sectional Editors:
Surgeon Rear-Admiral Sir P. W. Bassett-Smith, R.N. (retd.). K.C.B., C.M.G., F.R.C.P., F.R.C.S.
A. Douglas Bigland, M.D., Ch.B., M.R.C.P.
Col. S. Lyle Cummins, C.B., C.M.G., A.M.S. (retd.).
Lt.-Col. R. H. Elliot, M.D., F.R.C.S., I.M.S. (retd.).
Lt.-Col. Clayton Lane, M.D., I.M.S. (retd.).
R. T. Leiper, D.Sc., M.D., Ch.B.
P. H. Manson-Bahr, D.S.O., M.D., M.R.C.P., D.T.M. & H. Cantab.
Wm. Jenkins Oliver, M.B., B.Ch. Oxon., M.R.C.P.
Lt.-Col. Sir Leonard Rogers, C.I.E., M.D., F.R.S., I.M.S. (retd.).
H. Harold Scott, M.D., M.R.C.P.
J. D. Thomson, M.B., C.M.
Lt.-Col. J. H. Tull Walsh, I.M.S. (retd.).
C. M. Wenyon, C.M.G., C.B.E., M.B., B.S., B.Sc.
Warrington Yorke, M.D.
Editor of the Sanitation Supplements:
Lt.-Col. W. Wesley Clemesha, C.I.E., I.M.S. (retd.).
Editor of the Tropical Veterinary Bulletin:
A. Leslie Sheather, B.Sc., M.R.C.V.S.

CONTENTS.

CRITICAL REVIEWS.

PAGES
Alcock, A., Medical Entomology: A Retrospect 265–76
Lane, Clayton: The Malarias; Recent Studies and their Bearings 771–9
Leiper, R. T., Medical Helminthology: A Review:—
Part I. Platyhelmia—Trematoda, *cont.* 857–64
Part II. Platyhelmia—Cestoda 85–91
Wenyon, C. M., "Haemogregarines" in Man, with Notes on Some Other Supposed Parasites 527–50
Addendum 855

SECTIONS.

Amoebiasis and Dysentery .. 106–28, 400–15, 703–32, 1002
Avitaminoses 78–81
Beriberi 389–95, 812–17
Blackwater Fever 71–4, 353–6
Book Reviews .. 82–4, 166–8, 262–9, 346–52, 432–6, 521–6, 611–14, 685–6, 765–70, 856, 928–32, 1003–6
Cholera 366–73, 736–40
Dengue and Pappataci Fevers 383–5, 804–7
Dysentery, Bacillary, Ciliate Flagellate, Mixed and Unclassed 115–28, 406–15
Enteric Fevers in the Tropics 374–6, 747–8
Heat Stroke 67–70
Helminthiasis 203–61, 339–45, 615–44, 933–57
Infectious Jaundice 140–4, 582–4, 883–6
Japanese River Fever 386, 809–10
Kala Azar 92–105, 566–77, 865–76
Laboratory Methods 588–600
Leprosy 148–65, 480–96, 821–34
Malaria 291–308, 551–6, 958–78
Medical Zoology 418–21, 437–79, 780–802
Miscellaneous 1–66, 422–31, 509–20, 601–10, 645–84, 749–64, 845–54, 891–927
Oroya Fever and Verruga Peruana 810–11
Pappataci Fever 383–5, 804–7
Pellagra 75–8, 887
Plague 357–65, 741–6
Rat-Bite Spirochaetosis 581, 880–1
Relapsing Fever and other Spirochaetoses 129–40, 578–80, 877–80
Rocky Mountain Spotted Fever 387, 808–9
Scurvy 396–9, 818–19
Sleeping Sickness 309–38, 687–702
Sprue 416–17, 733–5
Tropical Dermatology 277–90
Tropical Ophthalmology 497–508, 979–89
Tuberculosis in the Tropics 183–202, 990–1002
Unclassed Fevers of the Tropics 388, 804–7
Undulant Fever 377–82, 803–4
Yaws 169–82, 835–44
Yellow Fever 144–7, 585–7, 882–3

(12603) Wt. P.1737/182 1,125 3/24 Harrow G.75 A 2

SECTIONS—*continued.*

Index of Authors 1007–31
Index of Subjects 1032–65
Tropical Diseases Bureau: List of Journals 1066–76

ILLUSTRATIONS, CHARTS, &c.

Leprosy in Hawaii 153
Diagnostic Characters of Some *Xenopsylla* Rat-Fleas 271
X-ray Photographs of Hand and Foot in Leprosy 155
Porocephalus Larvae in Lungs, Kidney and Peritoneum .. 419
Typical Haemogregarines and Spores of *Sarcocystis*, 529; *Haemogregarina hominis*, Krempf, 530; *H. inexpectata*, Roubaud, 531; Various Vegetable Cells which may contaminate Films, 534; *H. elliptica*, Sergent (Ed. & Et.) & Parrot, 535; *H. gallica*, Noc., 537; *H. cynomolgi*, Langeron, 539; *H. bovis*, Martoglio & Carpano and *H. boum*, Legras, 541; Various Bodies, probably of Vegetable Nature, which have been described as Parasitic Protozoa, 574; Vegetable Cells in Blood Film intentionally contaminated with Organisms from a Rabbit's Intestine, 547.
Schueffner's Method for Determination of the Splenic Index .. 551
Method of Determining Coagulation Time of Blood (Goeckel) .. 598
Profuse Infestation with Chiggers 797
Inter-relations of Beriberi and Epidemic Dropsy, Diagram .. 812
Map illustrating World-distribution of Leprosy 820
Results of Prolonged Treatment of Mixed Leprosy by Chaulmoogra Oil, *circa*. 1899 829
Treponemata in Early Yaws 839
Haemogregavina equatorialis Nattan-Larrier 855
Notice *re* the Late North Persian Forces (Memorial Medal) .. 261

ERRATA ET CORRIGENDA.

No. 5, p. 369. Ingredients of KO-RAN's Special Culture Medium for Cholera, Distilled Water, *for* "10 cc." *read* "100 cc."

No. 6, p. 483, line 3, *for* "SCOTT (R. R.), Med. Officer of Health," *read* "SKELTON (D. S.), Senior Sanitation Officer."

No. 6, p. 511, 4th para. from bottom, lines 3 and 4, *for* "3 with Gordon's Type II" *read* "3 with Gordon's Type III."

No. 7, p. 547. Haemogregarines in Man. The Magnification of Fig. 10, 1 x 1000, was omitted.

No. 7, p. 576. Summary of Castellani, line 3, *for* "5 cc." (injection of phosphorated oil) *read* "5 minims."

No. 7, p. 584. Summary of Coles, line 3, *for* "91" *read* "9."

No. 10, p. 802, line 25, *for* "sea-anemones and medusae living in salt water," *read* "sea-anemones and medusae living in fresh water."

No. 12, p. 992, 23 lines from bottom; and p. 995, 6 lines from end of first summary: BORREL's glands should be described as supraclavicular, not as subclavicular.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 1.

MISCELLANEOUS.

British Guiana. **Report of Proceedings of the West Indian Medical Conference held in Georgetown, British Guiana, from 28th June to 13th July, 1921.** [Boase (W. G.), President.]—152 pp. With 2 charts & 3 text-figs. 1921. Georgetown, Demerara: "The Argosy" Company, Limited, Printers. [Price not stated.]

This long report of the proceedings of the West India Medical Conference, lately held in Demerara, is full of interest, and if, as is natural, it gives preponderating expression to the experience afforded by British Guiana, it also represents in full measure the common and united interests of the West Indies, and touches many points of general interest to tropical medicine.

As questions of cardinal importance to these magnificent but still, perhaps, imperfectly-appreciated colonies, those relating to the establishment of a United West Indian Medical Service, to the development of a local auxiliary medical service somewhat similar to what used to be spoken of as the Indian subordinate civil medical department, and to the appointment of a Chief Sanitary Commissioner for the West Indies were fully discussed in the Conference. An auxiliary medical service of local growth, however, implies local schools of medicine and opens up other academical responsibilities for the discharge of which no machinery exists, so that although the proposal was generally approved it did not come to anything. It is to be hoped, however, that it will not be lost sight of. But the proposals for the unification of the West Indian Medical Services and for the appointment of a Sanitary Commissioner were adopted in formal resolutions for the consideration of the Home Government. The obstructions in the way of both these proposals, as was realized by several of the delegates, are of a political character—medical education can very well be carried on without political federation, but medical and sanitary administration cannot. Even an advisory Sanitary Commissioner-General, destitute of prerogative and devoid of the background of a Governor-General in Council, is a forlorn spectacle—the shadow of a dream.

This unanimous desire for an influential and independent Sanitary Commissioner is evidently not any reflexion on persons; it is, rather, evidence that the medical services of the West Indies are leavened with men of vision who understand that the full use and enjoyment of these fine colonies can only be attained under higher sanitary standards, evidence which is confirmed by the fact that a majority of the papers discussed at the Conference deal with some aspect of the public health and that most of these papers reach a high pitch of excellence. One of the most instructive is that by Dr. WISHART on some public health problems of Georgetown—a city almost in the zone of equatorial precipitation and entirely dependent on tidal drainage, where yet there is no pumping-plant for managing sudden flooding; a city where the best source of drinking-water is rain that has washed the roofs; where sewage awaits abominable removal in cesspools and open privies, and even a pail-system is a luxury and a limited privilege; and where—in natural harmony with all the rest—special antimosquito sanitation appears to be perfunctory, although 25 per cent. of the school children have been found to give a clinical history of filariasis. These are some of the problems—not altogether peculiar to Georgetown or to the West Indies—that Dr. WISHART has to deal with, not of course without some local sympathy and help, but in the face of an ignorant and apathetic proletariat. The imperfections of rural sanitation, again, are well described by Dr. De FREITAS in a paper entitled "Difficulties of Medical Practice in Country Districts"; the districts are too big; large areas of them are not under the control of any sanitary authority; and the country people, in unhealthy and overcrowded sites, live almost at the untempered mercy of Nature.

The interest in sanitary matters evinced by the Conference is further seen in papers (and discussions) on Infant Welfare in Georgetown by Dr. WISHART and by Dr. E. M. MINETT, on Hygiene and Sanitation in Primary Schools of British Guiana by Dr. ROSE, on water supplies and many other topics by Dr. E. P. MINETT, and in a valuable paper on food in relation to deficiency diseases by Dr. RICHARDS, of St. Lucia. Dr. WISHART describes the activities, mainly of a practical educative character, of the official Health Visitors, who supervise infants in the first year of life, and his figures show a reduced rate of infant mortality as a result of this supervision. Dr. E. M. MINETT deals with the work of the Baby-Saving League, a voluntary association which conducts clinics in town and country, subsidizes midwife-nurses in the country districts, and endeavours—notwithstanding the difficulty of getting women trained to maintain a high standard of precept and example—to raise the tone of obstetric and nursling practice among an ignorant and superstitious population. From Dr. ROSE's paper it appears that among school children in Georgetown 57·1 per cent. suffered from intestinal parasites, and 25·3 per cent. gave a clinical history of filariasis, and that among children in country schools 52·4 per cent. gave evidence of malaria infection, 21·2 per cent. gave a clinical history of filariasis, and 21·2 per cent. had intestinal parasites. From Dr. MINETT's careful paper on water supplies in Demerara, it is obvious that they are still of a primitive kind. From Dr. RICHARDS's paper one gathers that, speaking generally and excepting British Honduras, the food of the labouring classes in the West Indies is deficient in animal protein; to this deficiency of animal protein Dr. RICHARDS is inclined to attribute the prevalence of pellagra over other deficiency diseases in certain areas. The members of the Conference endorsed this view in a formal resolution recommending official encouragement of the rearing of "small" livestock and the subsidizing of fisheries.

Of papers (and discussions) on Preventive Medicine, those on Leprosy in its Public Health Aspects by Dr. HUTSON of Barbados, on Prophylaxis of Yaws by Dr. GIDEON of Jamaica, and on Alastrim by Dr. DICKSON of Trinidad, are particularly important both in their local aspects and in general interest. In the first of these papers the question—not a novel one—of segregating all cases of leprosy in a single common leper-colony was one of those discussed; it was generally agreed, however, that this was one of those attractive proposals that lose their charms when critically examined; it was unanimously agreed that for the control of leprosy notification followed by effective segregation was essential, and that the so-called "arrested cases" of leprosy should not be discharged from leper-asylums under any conditions, and this agreement was expressed in resolutions for the consideration of the Home Government. Very interesting is the discussion on prophylaxis of yaws opened by Dr. GIDEON with a statement of the almost miraculous cures effected in Jamaica by one or two injections of salvarsan preparations, notably neokharsivan and novarsenobillon. This wonderful success aroused the hope that prophylaxis would be resolved into a simple and direct process of searching out and treating every case; this hope, however, was shattered by Dr. GIDEON's discovery that cases cured by these drugs are susceptible to reinfection. Dr. PATERSON stated that his procedure in Grenada was, after getting rid of the external manifestations of the disease by means of salvarsan, to continue treatment with mercury and pot. iod., and he hoped in this way to extinguish yaws in his colony. Dr. DICKSON, in his remarks on alastrim, objects to the disease being defined as a mild form of smallpox; for although it is mild in the sense of causing little constitutional disturbance and mortality, it is not mild as an eruptive spectacle. His argument is that since alastrim has a remarkable resemblance to smallpox and can be controlled by vaccination, it is only fair from the standpoint of prevention and quarantine to call it smallpox, for the present, and this conclusion was adopted in two resolutions.

Particular attention must be directed to a paper by Dr. KHALIL, one of the members of the Filariasis Expedition sent out by the London School of Tropical Medicine, on certain limitations of the septic tank. At the request of the Colonial Secretary for British Guiana, the Filariasis Expedition investigated the effluent of several septic tanks as to their helminthology, and it was repeatedly observed that the living eggs of ankylostomes (and other intestinal worms) were present in it.

Among other subjects of purely local interest discussed at the Conference, the following may be mentioned: the training of native hospital nurses, the improvement of the public hospital, the treatment of venereal disease, and malaria-carrying mosquitoes.

In addition to formal resolutions that have already been noticed, others were adopted on the training and control of midwives, the registration of still-births, the further promotion of infant welfare activities, the medical inspection of schools, the enforcement of antimosquito ordinances, the development and improvement of the Government bacteriological laboratories, the improvement of the public hospital, and on the necessity for a local hill station. The Conference did well in recommending that all officers appointed to the medical services of the West Indies should be required to take a course of instruction in one of the schools of tropical medicine in England. But it was hardly so happy in its further recommendation that research in the West Indies should be the peculiar preserve of the London School of Tropical Medicine. The fields of research, like the ocean, are "free for all men to deal withal, as very sufficient for all men's use, and large enough for all men's industry"; and the resolution also forgets that one of the express desires of Sir Patrick MANSON, the Father of the Modern Science of Tropical Medicine and the Patriarch of the London School, was that the school course should put men in the way of investigating the causation of disease for themselves.

It must be mentioned, furthermore, that the Conference discussed a proposal to establish a medical journal for the whole of the West Indies, and passed a unanimous but unfurnished resolution in its favour. As some of the delegates observed, such a journal would be more appropriately consummative than precursive of medical union or at least of a medical college. Though some of the delegates foresaw editorial difficulties, it is doubtful whether the magnitude of those difficulties was realized.

A. Alcock.

MAURITIUS. **Report on Medical and Sanitary Matters in Mauritius,** by Andrew BALFOUR, C.B., C.M.G., M.D., B.Sc., F.R.C.P.E., D.P.H., Director-in-Chief, Wellcome Bureau of Scientific Research. —vii + 168 pp. With 1 chart, 3 maps, 5 plans & 130 illustrations. 1921. Printed by Waterlow & Sons, Limited, London Wall, London.

Those who have read some of Dr. Balfour's interim reports on sanitary matters in Mauritius will be prepared for the statement that it would require a sanitary revolution to make this beautiful and fertile island healthy. This verdict of a judicious expert has been corroborated by unbiassed observers—the clergyman and the objurgative mariner—whose views on mundane affairs are by no means always concordant; the one speaks of Mauritius as the "dirtiest-conditioned place among the colonial dependencies of Great Britain" and supremely distinguished for its "want of cleanliness"; the other describes Port Louis in terser language as "the filthiest port in the world." It is to be hoped that the advice embodied in this comprehensive and critical report, and the million pounds invested in the new Improvement and Development Fund, will end in the removal of these signally unanimous reproaches.

Of general interest in this report are the statistics of communicable diseases, of which malaria is the most important, *A. costalis* being the chief intermediary, though, as explained in a footnote, *A. maculipalpis* may be more dangerous than has hitherto been suspected. The only other species existent on the island is *A. mauritianus*, which probably is not formidable. The facts that the larva of *A. costalis* cannot endure shade and that the breeding-area of this species becomes much contracted during the winter season are regarded as hopeful from the preventive point of view.

The most destructive disease after malaria is pulmonary tuberculosis, to the spread of which the dark and ill-ventilated houses are conducive, while individual susceptibility is increased by the prevalence of ankylostomiasis, the recent investigations of KENDRICK having elicited the fact that about 60 per cent. of the population is infected with hookworm.

Dysentery and diarrhoea of course are prevalent, and enteric fevers are probably far commoner than is disclosed in official returns. Filariasis exists; its exact incidence is one of the many matters that need investigation. Influenza is favoured by the bad housing conditions, as was testified in the dreadful epidemic of 1919, which destroyed 11,000 people. Leishmaniasis is unknown in the island; as also, at present, is rabies. Special attention was directed to leprosy; the measures for dealing with it are described as hopelessly antiquated and inadequate, and the leper asylum is stigmatized as a disgrace to the colony. It is possible that plague may be dormant among the rats; the examination of rats for plague was found to be insufficient. Schistosomiasis exists in Mauritius, but the molluscan intermediaries have not yet been detected. Scabies, naturally, is extremely common. It is more than likely that undulant fever exists, though it has not yet been recognized. The treatment of syphilis, generally, is not conducted on satisfactory lines. Worm infections generally, apart from ankylostomiasis, are in need of investigation.

Of non-communicable diseases, alcoholism, beriberi, and nephritis are particularly mentioned.

There is little to be said for the hospitals, dispensaries, and other institutions of the kind; like the medical staff, they are insufficient for the requirements. The problems of maternity and child-welfare have only recently claimed attention, and the question of training nurses and midwives seems not to evoke much interest. The sanitary state of the schools is described as disgraceful; but Dr. Balfour's trenchant criticism of sanitation in Mauritius has already been noticed in this *Bulletin* (*Sanit. Supp.* 1921, p. 216).

In the author's scheme for the reorganization of the medical and health department the claims of the Bacteriological Laboratory are vigorously upheld, and not without good reason, since it was not so very long ago that a Royal Commission, bent on retrenchment, "actually advocated the abolition of this most essential institution."

In this fine report—quite aside from its intrinsic virtues—the author has set up a new standard, and a standard which, if it be generally followed will help sanitary reports to a better appreciation and a better reputation than tradition has conferred on them. The type, the copious illustrations from half-plate photographs, the bibliography, the index—all are most admirable features. In short, the report might be adopted as one of the textbooks for students of administrative hygiene.

A. A.

O'CONNOR (Francis W.). **Some Results of Medical Researches in the Western Pacific.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Mar. 16 & May 18. Vol. 16. Nos. 1 & 2. pp. 28–52. With 21 figs. (Discussion pp. 52–56.)

This unpretentious but interesting preliminary report, while confirming and supplementing some of MANSON-BAHR's conclusions regarding the incidence and aetiology of filariasis in the islands of the Pacific, contains a mass of novel and careful observation on this and other matters which will be as useful to local administrative authorities as to future investigators.

The area of the report includes Samoa and the neighbouring archipelagos of Ellice and Tokelau, and the main feature of the report is an intensive study of filariasis. The primary object of the expedition for which the report accounts was to test the value of certain drugs—tartar emetic, salvarsan preparations, collosols, etc.—some of which loud Rumour had declared to have a curative effect in filariasis, and although the author shows that Rumour, as usual, had been "stuffing the ears of men with false reports," he has made good use of his opportunities in other directions.

As regards the local aetiology of filariasis, *Aëdes variegatus* (= *Stegomyia pseudoscutellaris*) is shown to be in all the islands the principal, if not the sole, intermediate host. In the Tokelau Islands, indeed, it was the only species of mosquito observed. The chief breeding-places of the insect are the emptied husks of the coconut (*Cocos nucifera*), holes of all sorts in trees, but particularly the deep holes dug in the trunk of the living coconut palm by the Ellice islanders for catching rain-water; and in Samoa young pods of the cocoa (*Theobroma cacao*) left hanging on the tree after being gutted by rats, and holes in rock in sheltered places where dead leaves fall into the water they contain. Such breeding-places could be controlled without difficulty. The adult insects harbour in the rank undergrowth of the prevalent coconut plantations, and this undergrowth is particularly dense and still in those atolls where the lagoons are becoming filled up and the dry lands are broad and compact and sheltered from the south-east trade winds.

In none of the islands investigated was any evidence of "periodicity" of microfilariae in the blood ever detected. None of the drugs tried—novarsenobillon, galyl, kharsivan, tartar emetic, stibenyl, collosols of copper, selenium, and manganese; quinine hydrochloride, emetine—had any effect on the microfilariae circulating in the blood, though undoubtedly clinical symptoms were sometimes alleviated by the rest necessitated by continued treatment. High temperatures had no effect on the microfilariae; in a case of typhoid occurring in a European infected with filaria the microfilariae withstood temperatures that frequently were above 104° F. and on three occasions rose to 105° F.

The filarial incidence, however estimated, is high in all these islands but is less in the Tokelau than in the other groups, because the conditions there afford the least hospitality to *Stegomyia pseudoscutellaris*. On the compact atolls of the Ellice group, with shallowing lagoons entirely, or almost entirely, encircled by dry land—the atolls that provide the maximum amount of cover for Stegomyia—the filarial incidence is extremely high, amounting in one atoll to 73 per cent. of the large number of the population examined.

Where filarial incidence is extensive and individual infection also generally heavy, there the largest number of cases of elephantiasis (both with and without concurrent microfilaria in the blood) are found. Where, as in the Tokelau group, filarial incidence is not surprisingly extensive and individual infection not remarkably heavy, there is no elephantiasis at all to be seen. The author's statistics clearly demonstrate the interconnexion in all these islands of filarial infection and elephantiasis.

An accidental infection from the bites of an infected Stegomyia occurred almost under the author's eyes. The bites, which were suspiciously severe at the time, had been on the arm, and about 43 days afterwards there occurred swelling and tenderness of the epitrochlear gland. The gland was excised and was found to be infiltrated with haemorrhages and studded with plots of eosinophile cells. About 156 days after the date of the bite a severe attack of lymphangitis involving the axillary glands and the whole arm occurred, the temperature rose to 100° F., and the eosinophile count was 6 per cent. Afterwards there were further attacks, one of which affected the epididymis on the opposite side, and thereafter until the author left the islands eosinophile counts were constantly high, 11·5 to 16 per cent.

The stools of over 575 individuals were examined, with the following results :—

No evidence of infestation by Cestodes or Trematodes was observed in any of the islands.

Infestation with *Necator americanus* was found to be almost universal among adults in the Ellice and Tokelau islands and extremely prevalent in Samoa (where also *A. duodenale* and *A. ceylanicum* were each found once). Evidence of this infestation is manifested in the general indolence and weariness of the people and in their little resistance to bacterial infection.

Ascaris lumbricoides, though extremely common in Samoa, was not detected at all in the Ellice group. The only circumstance not common to Samoa and the Ellice Islands is that in the latter there is a variety of coconut the sweet young husk of which, called *utagau*, is chewed like sugar-cane. The author thinks that utagau may be mortal to ascaris. Certainly two Samoans known to him to be passing ova of ascaris in Samoa did not disclose any ova when they were examined after some months' residence in the Ellice Islands.

Trichuris trichiura is extremely common in the Ellice and was frequently found in children of one year, and is only less common in Samoa.

Strongyloides was not detected. *Oxyuris vermicularis* was not discovered in the Ellice, but two cases were observed in Samoa.

In 225 cases examined in the Ellice, *Entamoeba coli* was present in 8 per cent. and *E. histolytica* in 1·3 per cent., *Endolimax nana* in 4 per cent., *Iodamoeba bütschlii* in 1·3 per cent., *Giardia intestinalis* in 3·1 per cent., *Chilomastix mesnili* in 6·2 per cent., *Trichomonas hominis* in 7·5 per cent.

In 229 cases examined in Samoa the percentages were: *E. coli* 44·1, *E. histolytica* 9·6, *E. nana* 20·9, *I. bütschlii* 3·9, *G. intestinalis* 5·7, *C. mesnili* 12·7, *T. hominis* 13·1 ; and, in addition, *Enteromonas hominis* 5·7 and *Balantidium coli* 1·7. The absence of Balantidium from the Ellice is remarkable, since pigs, in abundance and in manner of treatment alive and dead, are equally characteristic of the Ellice and Samoa.

Tuberculosis in all the islands is a ravening calamity ; peritonitis and general tuberculosis are common in young children, tubercular glands in older children, phthisis in adults. The prevalence of ankylostomiasis renders the individual susceptible—or at least vulnerable —to tubercle infection, and the customs of the people are peculiarly conducive to its spread.

Yaws is prevalent in all the islands.

A. A.

Levaditi (C.) & Nicolau (S.). **L'immunité dans les ectodermoses.**—*C.R. Acad. Sci.* 1921. Nov. 2. Vol. 173. p. 794.

—— & ——. **Affinité neurotrope et purification du virus de la vaccine.** —*Ibid.* 1921. Nov. 7. p. 870.

—— & ——. **La vaccine cérébrale.**—*C.R. Soc. Biol.* 1922. Jan. 14. Vol. 86. p. 77.

—— & ——. **Vaccine pure cérébrale. Virulence pour l'homme.**—*C.R. Acad. Sci.* 1922. Jan. 23. Vol. 174. p. 249.

The authors have already shown* that ectodermic viruses, such as herpes and encephalitis on the one hand, and vaccinia and rabies on the other hand, possess affinities for the three ectodermal tracts—skin' cornea, and axial nervous system. Their new experiments disclose that a refractory condition of one of these tracts, particularly the cornea, is followed by an analogous condition of the nervous axis; but the skin is not immunized, or only slightly and transiently, as a result of vaccination of the cornea; nor does the skin protect the cornea, or one cornea the other cornea, by vaccination.

---

* This *Bulletin*, Vol. 19, p. 618.

Vaccinia virus after having been passed through the brain of 50 rabbits possesses the following properties: It is absolutely pure and aseptic. Inoculated into rabbits by the intracerebral route it kills, and almost always in 4–6 days. Its keratogenous and vaccinogenous properties for the rabbit are preserved. Injected into the veins of the rabbit it provokes general vaccinia. Inoculated into the skin of the monkey it produces vaccinal vesico-pustules at the end of two days, which disappear about the tenth day. This cerebral vaccine has been tried in man and has been found to give about equally good results with ordinary vaccinal virus while possessing the advantages of being aseptic and apparently keeping its properties indefinitely.

A. A.

KRAUS (R.). **O estado actual dos nossos conhecimentos sobre os virus filtraveis e invisiveis.** [The Present State of Knowledge of the Filtrable and Invisible Viruses.]—Reprinted from *Gaz. Clinica de Janeiro.* 10 pp. 1922. S. Paulo.

An excellent though brief résumé, mainly historical, showing how the progress of medical science and improved methods have reduced the list of diseases which a few years ago were ascribed to filtrable and ultra-microscopic viruses. The author also mentions the value of tissue reactions, for example, the *dermotropic* in variola and molluscum contagiosum, and the *neurotropic* in rabies and encephalitis lethargica, as aids to diagnosis, although the actual causative agents are unknown. Speaking of influenza, he is of opinion that Pfeiffer's bacillus is the prime cause and that some virus at present unknown and filtrable is responsible for some of the severe complications.

The paper is a good summary, but brings forward no new facts.

H. Harold Scott.

HARVARD UNIVERSITY. Official Register. 1922. June 15. Vol. 19. No. 33. 27 pp.—**Courses for Graduates. Announcement of the School of Tropical Medicine, Harvard Medical School, Boston, Mass. 1922-23.** Published by Harvard University, Cambridge, Mass.

The designers of this course for graduates assert, and they can do so without any fear of contradiction, that tropical medicine offers a superlative field for original work, and work of abundant application to the humane ends of the profession no less than in the prevention of disease and improvement of the public health.

Animated by a test that appeals to all the best instincts of our interesting profession, they have devised—mainly for medical graduates, but also for the sundry participation of others who are likely to profit—a magnificent concourse of studies, each contributory course of which, however, has its independent run.

The following are the individual courses of this comprehensive educational scheme:—

General Zoology as a sort of warp; Protozoology, which includes also methods of cultivating certain parasites; Helminthology;

Venomous Animals ; Tropical Plants, with reference to their poisonous and their possibly useful properties ; Medical Entomology ; Bacteriology of a very practical kind ; Pathology, macroscopic and microscopic, of Tropical Diseases ; Clinical Laboratory Methods ; Comparative Pathology of Tropical Diseases, in relation to infections of domestic animals that may be passed to man ; Infectious Diseases, with special reference to laboratory diagnosis ; Tropical Dermatology, consisting mainly of clinical demonstrations and discussions ; Preventive Medicine and Hygiene, including methods of sanitary analysis and sanitary survey ; Tropical Climatology, descriptive and comparative, and the use of meteorological apparatus ; Tropical Sunlight by the Research Fellow in Bio-physics ; a Clinical Course in Tropical Diseases ; and particular Diseases of South America.

The authors of this great course of studies have certainly upheld the principle that instruction in the principles and methods of work is the main function of a technical school.

A. A.

DELAMARE (Gabriel). **Objectifs, méthodes et enseignements de la médecine exotique.**—*Presse Méd.* 1922. Mar. 8. Vol. 30. No. 19. pp. 201-202.

The author gives expression to the view—now, indeed, fairly widely held—that, apart from a few diseases like yellow fever and sleeping sickness, " tropical " disease is more topical than tropical, being much more contingent on local conditions of life, standards of hygiene, means of communication, etc., than on esoteric tropical factors. Though it is obviously the first object of tropical pathology to study these topical or topographical diseases, the investigation of cosmopolitan diseases in a tropical environment also provides a second vast and promising field.

In the study of the topical diseases of the tropics the methods of the laboratory have naturally and for several reasons come first ; but the ultimate aim of medicine, apart from questions of epidemics, is clinical diagnosis confirmed in the laboratory.

[The great Mansonian tradition, unconsciously confirmed, could not have been better expressed.]

A. A.

FONTOYNONT. **L'école de médecine de Tananarive.**—*Presse Méd.* 1922. Sept. 6. Vol. 30. No. 71. pp. 1488-1490. With 2 text figs.

The Director of the School of Medicine, Tananarive, tells us that this school was founded by GALLIENI in 1897. It is about to be housed in more spacious quarters, with hospital attached, as is indicated in the illustrations. Entry is competitive, the number of places being determined each year. The students come almost entirely from the interior plateaux ; they engage when qualified to enter Government service and must be at least 18 ; they are all externs ; they receive a subsistence allowance of about 20 francs per mensem. Of the course, which lasts four years, the programme is given. There are also two Maternity Schools in Madagascar, where natives are trained as midwives. At present there are 150 students at the three schools, 50 of whom are maternity pupils. From its foundation to 1920 the School of Medicine has granted 336 diplomas for the practice of medicine and 208 for that of midwifery.

A. G. B.

FONTOYNONT (M.). **Caractéristiques de la pathologie malgache.**—*Bull. Soc. Path. Exot.* 1922. Mar. 8. Vol. 15. No. 3. pp. 153–158.

The diseases which most affect the public health in Madagascar are malaria and acute broncho-pulmonary affections. Less important are intestinal and venereal diseases and, in the third rank, alcoholism. Malaria, which is exclusively subtertian, is widespread. The negroes who inhabit the coast regions are much more resistant than the natives of Malay origin, who populate the mountainous interior. In the interior large sheets of water, for an undetermined reason, are much less harmful than small, and especially terraced rice-fields. That the population as a whole is either diminishing or only just holding its ground, the author seems to attribute to malaria. The broncho-pulmonary diseases are chiefly pneumococcal; tuberculosis is comparatively rare. The intestinal affections are almost exclusively diarrhoea and amoebic dysentery, which is increasing in a truly alarming manner in the interior. Diarrhoea attacks the children as soon as they are weaned and is the cause of great losses. Lastly the author draws attention to the increase of arteriosclerosis among the Malagasies; syphilis and alcoholism are becoming on the whole less prevalent, so that he is inclined to attribute this increase to the spread of malaria.

A. G. B.

MACFIE (J. W. S.). **The Prevalent Diseases of the Gold Coast.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 156–161.

While admitting the general improvement of the health of Europeans on the West Coast of Africa, Dr. Macfie finds that the death-rate is still three times as great as it should be and thinks that the health of native Africans has improved to a far less extent. Very little is known of the diseases of West Africa. Except in the coast towns, only a small and selected proportion of the sick are treated by doctors qualified in the European sense, the medical staff is exceedingly small having regard to the area of the country, and Africans are often reluctant to consult Europeans; [these facts are well known, but are sometimes overlooked].

With these reservations Dr. Macfie finds that the most serious diseases of the Gold Coast are venereal diseases, restricting the increase of the population, malaria, and ankylostomiasis, all preventable and readily curable. Of the devastating pestilences of the tropics, cholera and typhus are unknown, plague and yellow fever are uncommon, and trypanosomiasis is mild. Leishmaniasis and relapsing fever are unknown, undulant fever almost so, while dengue, sprue and bilharziasis occur, if at all, in a mild form. Scarlet fever, diphtheria, rheumatic fever, pellagra, infectious jaundice and trachoma are apparently unknown. Appendicitis and parasyphilis are rare. The author notes that stricture of the urethra is surprisingly uncommon considering the prevalence of gonorrhoea and the tendency of the African to excessive scar tissue formation. Gingivitis is very common, both in Europeans and natives. Pneumonia and broncho-pneumonia are frequent, especially in Africans. Bilharziasis is "not infrequently regarded by the Africans themselves as a children's disease of no importance." Skin diseases are very prevalent and of great variety. Diseases described as common, at least in some districts, are: cerebrospinal meningitis, smallpox, yaws, dysentery, especially amoebic, phthisis (very fatal), endemic goitre, dracontiasis. Filariasis is common but is frequently unaccompanied by symptoms. He concludes that by concentrated effort much might be done to render the Gold Coast more healthy and more populous.*

[A similar paper has been published by YOUNG for Sierra Leone (see this *Bulletin,* Vol. 14, p. 232). Two diseases mentioned by YOUNG as prevalent in Sierra Leone are not named by Macfie—myocarditis, attributed chiefly to ankylostomiasis, and interstitial nephritis, probably syphilitic.]

A. G. B.

KERNÉIS. **Note sur le fonctionnement de la maternité indigène de Dakar depuis son inauguration jusqu'au 1er mars 1920.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Apr. Vol. 2. No. 4. pp. 107–118.

The native lying-in hospital at Dakar containing 20 beds was inaugurated in July, 1919, with the object of lessening the infantile mortality and of furnishing instruction to the native midwife pupils. The mortality at birth in Dakar is described as passing imagination; women who have borne four or five children have lost them all at birth or soon after, and judging from the number who date their symptoms from a confinement many mothers must die. The internal management of the hospital is described. In the first month, though 25 women were admitted, only four came for their confinement. Its success may be judged from the table.

—	July, 1919.	August.	September.	October.	November.	December.	January, 1920.	February.	Totals.
Normal Confinements ..	1	7	13	9	9	9	16	30	94
Twins	—	1	3	1	2	3	1	1	12
Forceps	2	3	4	1	1	3	3	1	18
Basiotripsy	1	—	—	—	—	—	—	—	1
Miscarriages	—	2	4	0	4	0	3	2	15
Disorders of Pregnancy	7	14	8	8	10	18	8	5	78
Gynaecological Affections	14	8	3	5	4	11	10	2	57
Total of Hospital Admissions ..	25	35	35	24	30	44	41	41	275

The relative set-back in October–December was due to the fear of being inoculated for plague, of which disease one entrant died after delivery. After February the hospital became crowded; to be admitted it was necessary to be in travail. The success was due not so much to the comfortable conditions as to the results obtained; it was passed from mouth to mouth that after 11 days both mother and child went out well. The author remarks the frequency of twins and of miscarriage, so far as the figures go. To the hospital is attached an out-patient clinic, where women, before and after confinement, are seen; this has been equally successful; only obstetrical and gynaecological affections and babies are treated. Tetanus at 9–13 days is common; several infants have recovered under antitetanic serum and sedative treatment. The author has not seen the disease in older children nor in mothers.

---

* In a postscript to his paper (*Trans. Roy. Soc. Trop. Med. & Hyg.* Vol. 16. No. 4. p. 257) Macfie writes that he has recently diagnosed diphtheria at Accra in a native child.

Not the least advantage of the hospital and clinic is that the midwife pupils get solid instruction which, when they are scattered through French West Africa, they will turn to account in combating puerperal sepsis and infantile mortality.

Dr. NOGUE gave an interesting account of native practices in pregnancy and child-birth. One may note that infusion of cotton seeds is considered an excellent galactogogue.

[An interesting paper, worth the attention of medical administrators. Is there a similar institution in British West Africa?]

A. G. B.

NOGUE. **Note sur le fonctionnement de la polyclinique de l'hôpital indigène de Dakar de juillet 1919 à janvier 1920.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Feb. Vol. 2. No. 2. pp. 53–57.

Here are described three cases of "kolaism," manifested by palpitation and tachycardia, anginal pain and insomnia. In two instances as many as five nuts a day were eaten, and in one the symptoms vanished when the kola nut was given up. A case of relapsing fever is the first recorded from Dakar, but it appears possible that the patient was infected at Duala, Cameroons.

A. G. B.

BOURGES (Henry). **Les marins indigènes du centre de Sidi-Abdallah.** —*Arch. Méd. et Pharm. Nav.* 1922. May–June. Vol. 112. No. 3. pp. 232–242.

Of 959 men selected for sea service, 136 were Tunisians and 823 Algerians. Rejections were chiefly for defects of vision, granular conjunctivitis and trachoma, and feebleness of constitution. Each recruit had three months' training. Between November, 1920, and June, 1921, there were 481 cases of respiratory disease, of which 454 were acute bronchitis; of these 286 occurred in January and February. The large incidence of respiratory affections was attributed to rigour and abrupt changes of the temperature, want of endurance to cold and damp, insufficiency of warm clothing and the susceptibility of the African race. There were 24 cases of malaria, all but three believed to be relapses. A high proportion of skin disease, much of which was itch, is attributed to overcrowding. An epidemic of mumps, which affected 140 men, came to an end directly the hammocks were spaced out. At first a large proportion of men were below par, probably owing to restriction of food, the result of dearth in Algeria, and showed slight resistance to fatigue. After 3–6 months, of 90 men 77 had gained weight. Each recruit received an extra ration of 80 gm. of meat. The recommendations for such recruits in future concern, chiefly, improvements in quarters to obviate overcrowding, the supplementary ration and protection against cold. The experiment of recruiting natives of Northern Africa is considered to have been successful.

A. G. B.

PAM (M. M.). **Medical Services available for Natives on the Rand Mines.**—*Lancet.* 1922. June 10. pp. 1174–1175.

From the time that the natives are recruited for the mines to the time they go home they are under constant medical supervision. Three medical examinations—at the recruiting station, at one of two compounds in Johannesburg, and by the mine medical officer—precede their employment and each boy is weighed once a month. Here are described the system of treatment centres and the central hospital organization which tends to replace it, the nursing staff (white at the top) and the dressing stations. Clearly the mine employees are well looked after.

Tropical ulcer is common; it is stated that fungating tropical ulcers yielded to antiscorbutic diet.

A. G. B.

i. MAPLESTONE (Philip A.); ii. CUMPSTON (J. H. L.); iii. BRADLEY (Burton). **Research in Tropical Australia.** [Correspondence.]—*Med. Jl. Australia.* 1922. Apr. 29. 9th year. Vol. 1. No. 17. pp. 476–477; May 13. No. 19. p. 537; May 27. No. 21. pp. 590–591.

i. Dr. Maplestone, now Lecturer in Protozoology at the Liverpool School of Tropical Medicine and recently Acting Director of the Australian Institute of Tropical Medicine, was moved to the writing of this letter by a leading article in the *Med. Jl. of Australia,* urging the utilization of the Townsville Institute, which has been "allowed to languish without a head and without a *raison d'être,*" for a larger and better study of tropical diseases. Dr. Maplestone considers that such research in Australia is foredoomed to failure because of the paucity and inaccessibility of available material, and that time and money would be wasted. "In modern research the first essential is ample material." This Australia cannot supply. Such problems as plant and stock diseases and the destruction of timber by white ants might well be investigated at the Institute; hitherto the field has been restricted to human disease. Dr. Maplestone points out that the head of the Federal Ministry of Health not only controls from Melbourne the work of the laboratory but reserves the right of censorship over all scientific papers written by the staff. There are many objections to such control, and he suggests that the Director should be directly accountable to a Minister of the Crown, and himself responsible for the appointment of the staff and the nature of the work undertaken. Maplestone, however, regards the Townsville Institute as moribund, and instead of resuscitating it would have a laboratory in the Pacific Islands privately endowed after the model of the Liverpool School. The University of Sydney would naturally undertake its control and it should not come under Government.

ii. Dr. Cumpston, Director General of Health, writes from Melbourne that the equipment and facilities of Townsville are to be used for the best advantage in furthering the development of Tropical Australia and that laboratories have been, or are to be, founded at Rabaul and Papua.

iii. The author agrees with MAPLESTONE in the main, but considers that in Townsville and its surroundings there are "boundless possibilities for research," some of which he goes on to outline, *e.g.*, filaria, plague, leprosy, dengue.

A. G. B.

ELKINGTON (J. S. C.). **The "Mestizos" of Kisar, Dutch East Indies.** —*Med. Jl. Australia.* 1922. Jan. 14. 9th year. Vol. 1. No. 2. pp. 32–34.

From time to time reference has been made to a Dutch community which has resided for many generations in the small island of Kisar, or Kisser, situated north of Timor and separated by the breadth of England at Birmingham from Fort Darwin in Australia ; this constitutes an actual experiment in the white colonization of the tropics [see this *Bulletin,* Vol. 15, p. 297]. The author, Chief Quarantine Officer of the Department of Health of the Commonwealth, had an opportunity of visiting these people and inspecting their official records ; they now number some 200 at Kisar and about another 100 at Koepang, in Dutch Timor and elsewhere in the Dutch Indies. He summarizes his conclusions thus :—

" 1. That nine families of originally north European or mixed north European and native blood have persisted on Kisar for over one hundred years and have bred to five and six generations. In the case of the Joostensz family, the known date of birth of the eldest Kisar-born child of European blood was 1789. His descendants down to the year 1914 numbered thirty-eight at least and possibly more. His father, J. W. Joostensz, Commandant at Kisar in 1817, was born at Macassar in 1767, giving an uninterrupted period of tropical residence for this family of 154 years on the paternal side and at least 135 years on the maternal side.

" 2. That this has not been accompanied by loss of European characteristics of complexion and features, except as a result of admixture of native blood, and that even when so diluted the European physical characteristics still come out strongly in the fifth and sixth generations.

" 3. That the European standard of mentality, as shown by reaction to European methods of education, persists in substantial degree after five and six generations.

" 4. That these characteristics have survived in spite of environmental conditions and associations lasting for over sixty years, from 1819 onwards, and probably for some seventy years or more, which are generally supposed to be totally unsuitable for persons of European stock. These conditions have included native standards of food and food supply, endemic malaria, the psychological effect of what must have been for the earlier generations an acute sense of abandonment by their own race, life under the rule of native chiefs, constant association with a native race of low mentality, loss of European language and European religion, inter-breeding to a high degree and constant exposure to a tropical climate.

" 5. That there is nothing in the available history of these people to show that a tropical climate *per se* has tended to produce degenerative effects on them or to limit fertility.

" 6. That whatever evidence they may have shown of lowered physical or mental activity in the past can be fully explained by the environmental conditions of food supply, malaria and particularly of native associations, aided possibly by the accentuation of stock-weaknesses arising from inter-breeding over several generations.

" 7. That the measures adopted by the Government during recent years appear to have resulted in definite improvement in their physical and mental condition, particularly amongst the children of school age."

A. G. B.

VALLET (E. M.). **Notes sur la climatologie et la pathologie de Yunnanfou (Yunnan).**—*Bull. Med. Franco-Chinois.* Pekin. 1921. Apr.–July. Vol. 1. No. 2. pp. 55–63.

Yunnan-Fou at an elevation of some 6,000 ft. lies in Yunnan, a Chinese province bordering on Burma ; the town is just outside the northern tropic. An account of its diseases was given in 1914 by VADON [see this *Bulletin*, Vol. 5, p. 376]. The climate is that of the south of France; the temperature varies between extremes of —2·6° C. in February and 31·5° C. in June. Much rain falls in the summer. The account given is based on the admissions in 1919 to the French hospital, which has 34 beds and receives both indigent and paying patients; 32,781 cases were treated. *Malaria*, which heads the list with 2,850 cases, has been hitherto regarded as rare and mild; in this year it seems to have become endemic. *Syphilis* comes next with 2,289 cases. No precautions are taken against this disease and prostitution is uncontrolled. Primary and secondary lesions are often severe; grave tertiary symptoms are unusual. *Acute rheumatism* is reported (121 cases). *Tuberculosis* gives 418 cases, 249 pulmonary; the disease makes progress, especially among women and children.

Of *dysentery* (228 cases), 223 are claimed to be amoebic; liver abscess is rare. *Smallpox* is rare at Yunnan-Fou, but common enough in the province. The Chinese have organized a corps of vaccinators, which operates only in the early months of the year; the vaccine comes from Hanoi. Of *measles* there were 37 cases. *Scarlatina* has not been reported, nor *dengue*. *Plague* and *cholera* are absent. Of *diphtheria* there were 19 cases, and of *enteric* 38. *Tetanus* is often seen in new-born children (34 cases). *Filariasis* is unknown. *Beriberi* is endemic in the barracks; at the hospital 42 dry cases were treated. *Leprosy* (56 cases) is one of the chief diseases of Yunnan. The local belief is that it is transmitted through fowls' eggs. The Chinese recognize that the disease is conveyed by contact with merchandize or food, and the lepers, who live by begging, blackmail their neighbours by threatening to contaminate their property. It is a disease of poverty. Of *goitre* 222 cases were seen; one-fourth or one-fifth of the population of certain valleys is affected. The Chinese attribute it to the use of rock salt. *Ascariasis* is very common (1,817 cases). Of *eye diseases* 5,399 cases were seen—conjunctivitis, keratitis, entropion. The frequency of trachoma is attributed to the common towel in cinemas and restaurants.

A. G. B.

TUFFIER (Th.). **La médecine française en Extrême Orient.**—*Bull. Acad. Méd.* 1921. Dec. 27. Vol. 86. 3rd Ser. No. 43. pp. 440–446.

——. **Médecine française en Extrême Orient.**—*Presse Méd.* 1922. Jan. 28. Vol. 30. No. 8. pp. 149–152. With 1 text fig.

In the course of a felicitous speech upon the inauguration of the Pekin Union Medical College, M. Tuffier foresees among other things an incentive influence emanating from this magnificent philanthropic enterprise to other medical institutions in the Far East, including those of French origin. Of existing French institutions he alludes to the hospital of St. Michael and the hospital of St. Vincent in Pekin—the former a comfortable though not luxurious hospital for paying guests and possessing a small laboratory, the latter a poor and precarious charitable establishment. At Tientsin there is a French school of medicine, poor in equipment but rich in zeal. At Shanghai is the famous Ecole de Médicine de l'Aurore, founded and endowed by a French missionary—a modest school, but its hospital is one of the best appreciated in the Far East. In Canton four French doctors, assisted by Chinese, administer a modest hospital and medical school. The speaker also referred to the School of Medicine at Hanoi, to the Pasteur Institute of Saigon, and to the provincial hospitals and their maternity departments in Annam.

A. A.

BALDOVINO (C.). **Climatologia del Brasile in relazione coll' emigrazione Europea in genere ed Italiana in ispecie.** [The Climate of Brazil with Regard to Immigration of Europeans in General and of Italians in Particular.]—*Ann. di Med. Nav. e Colon.* 1921. Sept.-Oct. Year 27. Vol. 2. No. 3-4. pp. 645-648.

The failure of Europeans to maintain as good a state of health as the native in warm climates is to be ascribed to infective and parasitic diseases, to an irrational mode of life, and not to the climate *per se*.

The author divides Brazil climatically into three zones : (1) tropical, with a mean temperature above 25° C. (77° F.) ; (2) sub-tropical, comprising Rio and Santos ; (3) mild, with a mean temperature below 20° C. (68° F.), as in Parana, Santa Catherina, part of Rio Grande and San Paolo. He further subdivides them with regard to humidity.

For more than 30 years past the annual immigration figures have exceeded 100,000, and in 1913 rose as high as 192,000. Of these the Italians constituted nearly as many as all the other races together. The diseases most common among them are malaria, ankylostomiasis and anaemia, tuberculosis and trachoma ; none of these are the result of climatic conditions as such, and the author suggests that the Board of Immigration should issue simple instructions to intending immigrants pointing out the precautionary measures that might be taken to protect themselves from such infections.

H. Harold Scott.

RISQUEZ (F. A.). **Geografia Médica de Venezuela.**—*Gac. Méd. de Caracas.* 1921. July 15. Vol. 28. No. 13. pp. 187-208.

This long paper deals with a large variety of subjects, the first part with the country itself—its geography, climate, mineral waters, flora, fauna, distribution of population, and vital statistics; the second with its prevailing diseases. For many of his data, in fact the majority of those in the first part, he is indebted to other medical men.

The first part is statistical and descriptive. Of the fauna the only one specifically named is the *Planorbis guadalupensis* and its association with *Schistosoma mansoni*. From the vital statistics the chief points to note are that (1) the Federal District has the highest death-rate in the Republic, 36, 32, 22 per 1,000 in the years 1918-20 respectively ; (2) the most malarious states have the lowest death-rates, varying between 7 and 16 per 1,000; and (3) the elevated districts of the Andes have also a high death-rate, 23 to 30 per 1,000. Caracas, he states, is becoming depopulated owing to high infantile mortality, the spread of tuberculosis, alcoholism, syphilis, and the swarms of flies.

Passing to the second part of the paper, the author deals with a large number of diseases. Of these the most important only can be mentioned here.

Malaria is responsible for a large number of deaths, over 7,000 in the year, and in one district, Carabobo, with a population of 191,793, there were 1,303 deaths from malaria only. To carry out sanitary improvements on a large scale, the author states, is beyond the country's resources, and he hopes that the Rockefeller Institution or the Red Cross may come to their aid.

The next most fatal disease is *tuberculosis*, which accounts for nearly 5,000 deaths, and the fact is deplored that little is done beyond the opening of a few tuberculosis dispensaries.

The *dysenteries* run a close third to malaria and tuberculosis, 3,940 deaths being ascribed to these. Included in this group are both amoebic and bacillary forms, and, with the former, hepatic abscess. To remedy these he asks for a proper water supply and for the undertaking of an antifly campaign. It appears strange that the next commonest cause of death should be *tetanus*, to which 3,240 deaths are attributed. A large number of these are preventable, being cases of infantile tetanus from faulty attention at birth ; many are also put down to chiggers and their extraction. The first is clearly remediable.

Intestinal parasites, particularly ankylostomes, are a fertile cause of death, directly or indirectly. One thousand four hundred and fifty-two deaths were reported as due to *enteric fevers*, but Dr. Risquez states that he has little confidence in these figures. He had himself just seen a case of tuberculosis dying after more than six months fever which had been registered as typhoid, and, on the other hand, many of the cases in Caracas denominated malaria or " paludic fever " were in reality enteric.

Under the heading of *typhus fever* he mentions a disease which he calls Guacarapa fever ; it has a clinical picture indistinguishable from typhus, he states, but is not contagious, and in connexion therewith mentions the " Piroplasma hominis " of WILSON and CHOWNING, which they formerly believed to be the cause of Rocky Mountain fever. After some discussion he concludes that it is probably true typhus.

Syphilis and *venereal diseases* are very rife and are undoubtedly spreading.

Other diseases receive only cursory mention, and it may be noted that *yellow fever* has not been met with for several years.

The article shows evidence of having been carefully prepared and is an excellent résumé of the diseases most commonly encountered in Venezuela.

H. Harold Scott.

SAMBON (Louis Westenra). **Tropical and Sub-Tropical Diseases.**—*Jl. Trop. Med. & Hyg.* 1922. June 15. Vol. 25. No. 12. pp. 170–185. With 12 text figs.

This very interesting paper was read at a meeting of the Royal Colonial Institute in January, 1920, and is reprinted from *United Empire*. The author's subjects are: malaria from 1000 B.C. onwards, with details of LAVERAN's discovery and of the work of MANSON and ROSS, a first-hand account of the Campagna demonstration and of the infections contracted from mosquitoes brought to London in 1900 ; yellow fever, with an account of the American (Reed) Commission of 1900 ; warbles, with a graphic account of the parts played by the female Dermatobia and the carrying mosquito (the " mosquito worm " has long been known in South America and is mentioned by BERNABI COBO in 1653) ; the history of the introduction of the black and brown rats to Europe, as well as other topics. Dr. Sambon gives reasons for his belief that the black rat was well known to the ancient Greeks and Romans and that the brown rat was familiar in Europe at least as early as the second century A.D. We learn amongst other things that the ancients protected the scarab, or dungchafer, because it destroyed the ankylostome.

[In regard to the Reed Commission and the statement that: It was then universally accepted that it (yellow fever) was spread by fomites, that is . . . in articles of bedding, it is worth noting that HIRSCH (1883) writes :—

"Even the most intimate kinds of contact, such as the healthy and the sick sleeping in one bed, the attendance of physicians and nurses upon the sick, the use of the uncleansed linen, clothes, or beds of yellow fever patients, post-mortem examinations of their bodies, and the like, have in no wise contributed to the spread of the disease. Particular emphasis has been laid in some quarters upon the fact that specially designed experiments to induce infection by the inunction or inoculation into the skin of the vomit of yellow-fever patients, and by the wearing of the linen and clothes used by the sick and saturated with their perspiration, have always yielded a negative result."]

Published in a popular monthly magazine the article would enthral the readers.

A. G. B.

MARZINOWSKY (E. I.). **Das Tropeninstitut zu Moskau.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 7. pp. 205–208.

The author estimates that before the war the yearly average of malaria cases in Russia was five millions, and in the last two years the number has considerably increased. "Tropical" malaria has occurred indigenously, in many instances, near Moscow. Besides malaria there are found in the Caucasus and Turkestan kala azar, oriental sore, pappataci fever, dengüe, tick fever, filariasis, amoebic dysentery, and Lamblia and Trichomonas infections of the large bowel, as well as protozoal diseases of stock. The need for a tropical institute has long been recognized for study of malaria, etc., for the organization on a large scale of measures against these diseases, and for the instruction of students. In September, 1920, a Tropical Institute was opened, with the author as Director. The departments are: Protozoology, under the Director; Chemotherapy, under Prof. SMORODINZEW; Entomology, including study of measures to control disease-bearing insects, under Dr. NIKOLSKI; Helminthology, under Prof. SKRJABIN; and a small veterinary department (a larger one exists already at Moscow). The Institute has 30–40 beds, an animal house and a museum. Courses for students have commenced and the first report is in preparation.

A. G. B.

ACCRA. **Medical Research Institute. Laboratory Report for the Year 1921. Appendix A.** [MACFIE (J. W. S.) & INGRAM (A.).]— pp. 41–51.

This report consists of a general survey of work done in the laboratory. Of 1,759 routine examinations of clinical material, 1,197 were of blood. Of 627 native school children thus examined (one film), 261, or 41·6 per cent., were found infected with malaria. In 233 the parasite was *P. falciparum*, in 13 *P. vivax*, and in 21 *P. malariae*. Crescents were found four times.

In 33 cases the Sachs-Georgi test was carried out simultaneously with the Wassermann, and in all the result was the same. Since the technique of the Sachs-Georgi test is relatively simple, it should prove useful and practicable in out-stations.

The notes are given of two cases of Dermatitis Papillaris Capillitii and one of psammoma of the dura mater associated with an exostosis of the skull.

The record of the isolation of a polymorphic trypanosome from a mule is of interest because though a guinea-pig and 21 rats were infected from it, on only one occasion in one rat were posterior nuclear forms (scanty) found. This "indicates how difficult it may sometimes be to distinguish *T. pecaudi* from *T. gambiense* in animals." It is not stated why the parasite was assigned to the species *pecaudi* rather than *brucei*.

Experiments made to determine whether the fruit of the ackee (*Blighia sapida*) is toxic on the Gold Coast showed that large doses of extracts of over-ripe or otherwise unsound fruits were apparently almost harmless to rats, dogs and monkeys; assistance was rendered by Mr. SIMMONS, who had assisted Dr. H. H. SCOTT in his researches into "vomiting sickness" in Jamaica.

During the year 107 post-mortems were made (104 in Africans). Pulmonary diseases accounted for 22·4 per cent.

Of 532 samples of mosquito larvae examined for the M.O.H. during the year 71·6 per cent. were *S. fasciata* and 22·9 *C. fatigans*, 18 other species making up the rest. The total number of species recorded at Accra is now 64. Two per cent. of the larvae were *C. tigripes* var. *fuscus*, one of our insect friends for the larva preys on other larvae or its own kind and the imago is apparently not a blood-sucker.

Of 270 rats examined during the year 105 were *Cricetomys gambianus*, the pouched rat. Its common flea is not *X. cheopis*, but *X. aequisetosus* End. The authors suggest that, like *X. astia* in India, this may prove to be a less efficient carrier than *X. cheopis*, which would account for the small tendency of plague to spread in Accra.

One may also note from this report that a motor car fitted for use as a mobile laboratory is in service, and a second was to be soon ready, as well as the sad statement that the financial state of the Colony has necessitated drastic reductions in estimates amounting in the case of the Medical Research Institute to no less than 40 per cent.

A. G. B.

GOUVERNEMENT GÉNÉRAL DE L'AFRIQUE OCCIDENTALE FRANÇAISE. Services sanitaires et médicaux. **Rapport sur le fonctionnement de l'Institut de Biologie pendant l'année 1920.** [Noc (Fernand).] —61 pp. 1922. Paris: Emile Larose, 11, Rue Victor-Cousin.

The French West African Institute of Biology at Dakar took its origin from the bacteriological laboratory of that town. It has an annual subvention of 200,000 francs and includes three sections: Human Microbiology, Animal Microbiology, and Biochemistry. Here also are prepared the serums and vaccines needed for French West Africa.

Human Microbiology.—Collections of mosquito larvae are made in Dakar daily. *C. fatigans* and *S. fasciata* abound, but no Anopheline larvae are brought in though the adults are common in the houses. *A. costalis* and *pharoensis* are frequent, hibernating in the winter and reviving in June before the first rains.

The sand-flea, *Echidnophaga gallinacea,* abounds at Dakar, on poultry, the muzzle and ears of cats, on rats, and on the legs and arms of people who go barefoot or work with their hands near the ground. It is often found on children. The larvae feed on fluid blood ejected by the adults. On a white rat swarming with these fleas an emulsion of plague bacilli was smeared and the bacilli were recovered from the dejecta of the fleas on the death of the rat a week later. The fleas may therefore serve in the spread of plague, but they do not, like *X. cheopis* and *P. irritans,* leave their dead host. The finding of another species of flea infected with fungi leads the author to suggest that these insects may be responsible for the mycoses so frequent on the legs of the Senegal natives.

Under Applied Zoology is recorded the installation at Dakar of a laboratory of marine zoology. It was found that *Naja nigricollis,* of which ten specimens were captured, must be classed with *Sepedon haemachates* as a " spitting snake " ; it projects its venom more than 50 centimetres when excited.

Medical Bacteriology.—The pneumococcus was isolated from cases of arthritis and from abscesses in various situations ; here as elsewhere in Tropical Africa the natives are very susceptible to this organism. The subject of antipneumonia immunization is discussed at some length, and it is suggested that a medical officer should be seconded to study the subject for two years. A propos of a change of diagnosis from malaria to cerebrospinal meningitis as a result of lumbar puncture in a case described, it is suggested that clinicians should examine the cerebrospinal fluid in all cases of fever.

Under heading Antirabic Service a table is given of 19 persons treated at the Institute ; in eight the biting animal was only suspected of rabies. Rabies in dogs is not common in French West Africa, and the disease is rarely transmitted to man, possibly because the affected animals die more rapidly than in cold climates. The details are given of the first case of human rabies observed in 1920 in Senegal.

Plague.—In 1920 the plague bacillus was detected in the humours and tissues 51 times. The author thinks that the virus is kept up in rats by cannibalism, especially during periods of drought and when food is scarce ; the strain of plague becomes thus mild or chronic. From the results of experiments in vaccination of baboons it was decided to substitute for two injections every six months a single larger injection every three months. This change was obligatory on the troops only ; cases of plague amongst them have been extremely rare, whereas they have been numerous among the civil population. Subcutaneous inoculations do not seem to protect against lung plague. A vaccine in ground-nut oil has also been used, with what results is not stated. A large quantity of vaccine was distributed, but much remained unused. " The people fled before the vaccinator, who himself symbolized the plague. . . . There were, in fact, cases of death a few days after inoculation."

Short sections on Veterinary Microbiology and Biological Chemistry bring the report to a close.

A. G. B.

SERGENT (Edmond). **Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1921.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 121–141.

This report includes an account of the microbiological and chemical examinations undertaken during the year, the work done in rabies and malaria, a list of vaccines, serums and the like issued by the Institute, and classified lists of papers published with brief summaries of their contents.

Among the 11,764 examinations are included—sero-diagnosis for undulant fever 1,381, microscopic examination for malaria 1,598, sero-diagnosis of enteric fevers 2,957, and of typhus 1,700. There were 845 Bordet-Wassermann tests and 410 microscopic examinations for tubercle. A large number concerned diseases of domestic animals. The account of the rabies service consists of the usual statistical tables: 1,918 persons were treated, a number smaller by 636 than in the previous year; the fact that persons who could pay were required to do so led to a stricter surveillance of domestic animals. Examples given of the antimalarial work in certain villages with neighbouring villages as controls show incontestably its value. The table of vaccines, serums and diagnostic reagents for medical and veterinary use occupies one and a half pages.

A. G. B.

MEDEDEELINGEN VAN DEN BURGERLIJKEN GENEESKUNDIGEN DIENST IN NEDERLANDSCH-INDIË. 1921. Vol. 3. pp. 192–247. [In Dutch and English.]—**Verslag over de werkzaamheden, verricht aan het Geneeskundig Laboratorium te Weltevreden gedurende het jaar 1920. Annual Report of the Geneeskundig Laboratorium (Medical Laboratory) at Weltevreden, 1920.**

From this long report, chiefly of local value, a few observations of general interest may be gleaned.

An attempt was made to infect eight monkeys with *Ancylostoma duodenale* and *A. caninum* larvae, half from man and half from dog, administered in milk. All vomited the draught. The animals remained healthy, no ankylostome eggs were found in 4½ months' examination, and at autopsy no ankylostome worms.

A beginning was made with the systematic examination of school children for tuberculosis. To estimate the value of the procedure in the tropics each received a cutaneous injection of tuberculin, both bovine and human; the assistance of the teachers and the consent of the parents having been secured, no difficulties were met with. The results are to be published.

A large number of samples of milk tested were adulterated, chiefly with coconut milk, "obtained by mixing the fleshy part of the coconut, well grated, with water and straining through a piece of cloth."

Samples of "Korintji rice," of ages varying between 1 and 100 years, were tested for antiberiberi vitamin. When this and freshly harvested rice respectively were pounded to produce kampong rice, though each contained a similar percentage of $P_2 O_5$ the fresh rice administered to test birds was protective against beriberi, whereas the old rice was not. In the old rice, therefore, the $P_2 O_5$ percentage is not a satisfactory indicator. A loss of digestibility rather than of vitamins is suggested, and further work is indicated.

Tests were made of the urine of a number of people. The percentage of nitrogen excreted was found to be very low [*cf.* YOUNG, this *Bulletin*, Vol. 16, p. 237].

A. G. B.

KUIJER (A.). **Uit de Jaarverslagen van den Militair Geneeskundigen Dienst te Soemba 1919 en 1920.** [From the Annual Reports of the Military Medical Service at Soemba (Dutch East Indies) in 1919 and 1920.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 1. pp. 35–130. With 1 map, 3 charts and 1 text fig.

This is a rather lengthy report on the local distribution of malaria, dysentery, leprosy, tuberculosis, worm disease, tropical ulcer, a contagious disease of the throat, filariasis, yaws, and an unclassified epidemic fever. It contains little material of general interest.

Tropical ulcer was treated successfully with the powder recommended by VINCENT [this *Bulletin*, Vol. 15, p. 182].

The contagious throat disease probably is angina Ludowici; it causes at certain times a high mortality.

Syphilis practically does not occur, but yaws is widely spread and has various manifestations.

The unclassified fever was seen in an epidemic form and is described in detail. It has some likeness to dengue and the allied fevers. The accompanying rash (large maculae) appeared with the onset and lasted till one or two days after the fever had subsided. The onset was sudden, the fever ended critically. As a rule there was a marked leucopenia.

W. J. Bais.

BRUG (S. L.). **Extract uit het Jaarverslag van het Centraal Militair Geneeskundig Laboratorium over het jaar 1921.** [Extract from the Annual Report of the Central Military Medical Laboratory in 1921.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 332–354.

The following subjects of general interest in this report may be mentioned :—

Beriberi.—A rise in the number of cases among soldiers and sailors urges the author to warn against the use of polished rice in the army [see this *Bulletin*, Vol. 19, p. 73.]

Amoebic Dysentery.—Cane sugar enemas [see this *Bulletin*, Vol. 19, p. 32] were found clinically useful, though they did not always cause the destruction of the amoebae.

Bacillary dysentery increases in frequency at the time of the manoeuvres. The same must be expected in wartime. An experiment of vaccinating troops with " Dysbacta " is recommended.

W. J. Bais.

SITSEN (A. E.). **De aetiologie der levercirrhose.** [The Etiology of Cirrhosis of the Liver.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 1. pp. 5–9.

Of a series of 50 livers, obtained in post-mortem examinations, Sitsen found 3 to show the gross changes of cirrhosis. Of the remaining 47 he excludes 6 (2 of leprosy patients with numerous lepromas and 4 of syphilis cases with important increase of fibrous tissue, due to that disease). Of the remaining 41 livers only 16 did not show any microscopical signs of cirrhosis. In the other 25 the fibrous tissue round the branches of the portal vein was more than normal and there existed a distinct, chiefly lymphocytic, infiltration.

In Europe JAFFÉ found microscopically normal livers in people over 50 years in only 7 out of 50 cases. but Sitsen states that his series (Java) contains only few elderly persons. The gross changes of cirrhosis of the liver are far more frequent in the Dutch East Indies than in Europe. The author cites JAFFÉ, who could experimentally produce cirrhosis of the liver in rabbits by injection of blood-destroying poisons. He thinks that the most important blood-destroying poison in the tropics is the malaria virus, and once more emphasizes his opinion that malaria plays an important part in the etiology of cirrhosis of the liver in the tropics.

W. J. Bais.

i. NOGUE. **Note sur la fréquence du cancer du foie primitif chez les indigènes du Sénégal.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. June. Vol. 2. No. 6. pp. 155–156.
ii. ALPHAND. **Observation d'un épithélioma de la gencive supérieure.**—*Ibid.* pp. 156–157.

i. The author says that malignant tumours are rare in the natives of Senegal, and that the only form of visceral cancer he has encountered is cancer of the liver. In 18 months at the Native Hospital he has seen 2 osteosarcomas, 2 adenosarcomas, 2 cases of epulis and 7 hepatic cancers; no instances of cancer of uterus, intestine or stomach. All the liver cancers were primary and in four cases the diagnosis was verified at autopsy. This localization is attributed to the wide prevalence of intestinal parasitism, to the presence of parasites or their eggs in the liver itself, and the great frequency of cirrhosis in natives although the great majority do not take alcoholic drinks.

ii. This case, in a Fulah woman, was of seven years' duration.

In regard to the relative prevalence of hepatic cancer and epulis, LE DANTEC refers to a possible relation between epulis and the native habit of chewing a wooden stick, as well as to the frequence of intestinal parasitism.

A. G. B.

MASSEY (A. Yale). **Cancer of the Liver in the African Native.**—*Jl. Trop. Med. & Hyg.* 1921. Aug. 15. Vol. 24. No. 16. p. 216.
——. **Further Note.**—*Ibid.* 1922. May 15. Vol. 25. No. 10. p. 127.

i. Two cases from the Kasai district of Belgian Congo; in both the tumour was of the multiple nodular form and was considered to be of secondary origin, though no primary focus was found. They are the first cases of liver cancer met with by the author in 15 years.

One was a Batatela woman of about 30 years, who had lived the ordinary native life; the tumour weighed 14 lb. The other was a Batatela man of about 40 years, a typical native; the tumour weighed 10 lb.

ii. A third case from Coquilhatville, several hundred miles distant, in a male aged about 30 who, though he had worked among Europeans for some years, had kept to his native customs. He had felt discomfort in the hepatic region for about six months before admission *in extremis.* The autopsy disclosed a huge nodular liver of about 11 lb., the nodules having a soft broken-down centre giving the organ a mottled appearance. The Imperial Cancer Research Institute, from examination of a single nodule, describe it as an adenocarcinoma and probably primary.

A. A.

APPEL (Fritz). **Ueber multiple Adenokarzinome der Leber bei Negern.** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 10. pp. 309–314. With 2 text figs.

A search through the literature has shown the author that cancer of the stomach and uterus is a rarity among negroes, but that this is compensated by the greater frequency of other forms, such as multiple adenocarcinoma of the liver. His own material was obtained in Fernando Po, where he was interned for three years with German troops from the Cameroons. In that period about 5,000 persons were admitted, of whom 623 died. Incidentally, he says that 180 deaths were from amoebic dysentery, 115 from pneumonia, 76 from trypanosomiasis and 69 from tuberculosis. The tumours, the nature of which was verified either by operation or at the autopsy, numbered 41. Of these 30 were benign (lipomata 17, cysts 8) and 13 malignant (6 carcinoma and 7 sarcoma). The multiple adenocarcinomata of the liver were 4. He is uncertain whether this form starts in the liver cells or the bile ducts, probably the latter. He was not aware at the time that liver flukes may give rise to cancer, and they were not looked for. *Schistosoma mansoni* was found in several cases, but not in these. The cancer patients were two men and two women between 20 and 40; metastases were found in one case—in the lung. Details of the cases conclude the paper.

A. G. B.

FORSYTH (W. Leonard). **Primary Carcinoma of the Liver.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 295–296. With 1 plate.

ROGERS describes cirrhosis of the liver as common among Mohammedans and the author agrees that it is relatively frequent in India. He has seen three primary carcinoma cases and describes in detail the autopsy on one of these patients. The liver weighed 106 oz. and was hobnailed. He discusses the origin of cirrhosis and attributes it to unknown toxins, organic, bacterial and protozoal.

A. G. B.

SNIJDERS (E. P.) & STRAUB (M.). **Eenige gegevens over het voorkomen van Gezwellen bij de verschillende rassen in Deli.** [On the Occurrence of Tumours in Different Races in Deli (East Coast Sumatra).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1921. Vol. 61. No. 6. pp. 625–650.

The authors, working at the Pathological Laboratory at Medan, have examined since 1914 262 tumours, partly found by themselves in post-mortem examinations, partly received from hospitals on the east coast of Sumatra. Tumours of all descriptions were found. From a calculation in which the classes of ages are taken into the account it appears that malignant growth is certainly not less frequent in Javanese and Chinese coolies than it is in Europe, contrary to the common opinion hitherto. The great frequency of primary cancer of the liver is remarkable; in 90 per cent. of the cases the livers were cirrhotic. Cancer of the stomach was not found in Javanese; cancer of the intestine is comparatively rare; cancer of the penis is not uncommon in young Javanese men, nor cancer of the portio in Javanese women. Melanotic tumours are rare. Ovarial cystadenoma is common in Javanese women, but fibromyoma of the womb is rare. A few so-called "simple mixed tumours" (orbit, salivary glands) have been seen.

The conclusions agree beautifully with those of DANIELS (Malay States, 1903) and DEGORCE (Tonkin, 1913) and, as far as primary liver cancer is concerned, also with Japanese publications.

W. J. Bais.

SNIJDERS (E. P.) & STRAUB (M.). **Over het primair levercarcinoom in de tropen (naar Aanleiding van 57 waargenomen gevallen).** [On Primary Cancer of the Liver in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 253–289. With 1 plate.

The authors give the following summary of their interesting and exhaustive article :—

1. Primary liver cancers are about 35 times as frequent in Deli (East Coast Sumatra) as in Europe. They are common in Javanese as well as in Chinese.

2. The prevalence of this disease is due chiefly to the liver cell carcinoma. It is doubtful whether cancer of the biliary ducts is more common here than in Europe.

3. The high number of liver cell cancers is accompanied by great frequency of cirrhosis of the liver, which, however, is not so prevalent here in comparison with Europe as is carcinoma.

4. Notwithstanding the greater prevalence of liver cancer the proportion of cases with and without cirrhosis is approximately the same as in Europe, *i.e.*, nearly 90 per cent. of the cases is found in cirrhotic livers.

5. The cirrhosis nearly always shows the Laennec type, exceptionally the type of Hanot.

6. The liver cell cancer often occurs in young people. Cases in patients of 20–30 years are not rare. The cancer of the biliary ducts seems here more a disease of the aged.

7. Anatomically a unicentric origin of the liver cell cancer is very probable. The primary centre is situated about three times as often in the right as in the left lobe.

8. Benign adenoma of the liver is very rare in Deli. Only in very exceptional cases does a cancer probably originate from an adenoma.

W. J. Bais.

DE LANGEN (C. C.). **Die studie van het kankervraagstuk in de tropen.** [The Cancer Problem in the Tropics.]—*Nederl. Tijdschr. v. Geneesk.* 1921. July 2. Vol. 65. (2nd half year.) No. 1. pp. 24–27.

Bacteriology and protozoology, which are of such enormous importance in the tropics, have so absorbed the attention of research workers that the cancer problem has been badly neglected up to quite recent years. The first impetus to systematic research in this line in Dutch East India was given by Professor ROTGANS, Founder of the Cancer Institute at Amsterdam. De Langen carefully went through the clinical notes of different hospitals in Java for the years 1906–16. Amongst 422,943 Indian, Chinese and Arabian patients, he found 460 cases of malignant disease, *i.e.*, just over 1 per 1,000. Even slightly lower figures were furnished, namely 44 cases of carcinoma out of 48,838 patients by the Central Hospital at Weltevreden, where the staff was of such a high standard of efficiency as to justify the conclusion that very few cases had been missed. In striking contrast with Europe, where it represents nearly one-third of all cases of malignant disease, carcinoma of the stomach was found only in a few of the 460 cases mentioned above, and in 50,000 consecutive patients at the Central Hospital not a single case occurred. De Langen himself, in his 16 years at the Central Hospital, three times made the clinical diagnosis of carcinoma of the stomach, but post-mortem they were found to be cases of primary sarcoma. Primary carcinoma of the liver is most frequently found (duct-carcinoma or carcinoma of the gall bladder was never found), followed by carcinoma of the cervix, penis and tongue. Carcinoma of the breast was exceedingly rare.

T. Joekes.

Hoffmann (W. H.). **Ein Beitrag zur Krebsätiologie auf Grund der Krebsstatistik in Cuba.**—*Muench. Med. Woch.* 1922. Feb. 24. Vol. 69. No. 8. p. 271.

A statistical study has led Behla to the conclusion that the "virus of cancer" gets access to the body in raw garden vegetables. In the island of Cuba fresh garden produce does not contribute to the diet; it is therefore a good place to test Behla's conclusion. The statistics for the years 1900 to 1919 are furnished. The figures of deaths from malignant disease range from 26·5 per 100,000 in 1900 to 44·2 in 1910, since which there has been a slight rise, to 47·9 in 1919. The comparative figures from Europe are 57 in Prussia, 132 in Switzerland, and 140 in Denmark, but it is remarked that the Cuban figures are probably below the reality. It is concluded that in Cuba, as elsewhere, cancer mortality has risen, and that the figures are against the assumption of any relation between cancer and uncooked vegetables.

A. G. B.

Le Dantec (A.). **Tumeur mixte du maxillaire supérieur d'origin dentaire.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 485–488. With 3 text figs.

Three cases of large adamantine tumours of the jaws in natives of West Africa are here figured and discussed. Dr. Gontier contributes an account of their histology. They consist of a dense fibrous stroma honeycombed at the centre by cyst-like cavities lined with pavement epithelium and filled with a hyaline substance. From these cavities strings of cells having a sarcomatous or endothelial appearance ramify. In other parts the fibrous stroma forms a network containing large islands of carcinomatous-looking cells. In other parts again groups of nests of imbricating epithelioid cells occur. Finally there are places where the stroma is cartilaginous and the form of the cells is also modified. The tumours, in short, form an association of diverse elements and are best described as mixed tumours.

A. A.

Jame. **Epithélioma malpighien pavimenteux lobulé à marche rapide chez un indigène nomade des hauts des hauts plateaux.**—*Arch. Inst. Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 114–118. With 2 text figs.

The author, who has practised for some months in the high plateau country of Algeria, finds malignant growths to be apparently of rare occurrence but epithelioma to be less unusual than other forms. The patient was a man of 65 with a large tumour of 7–8 months' duration occupying one side of his face. The examination of two fragments led to the diagnosis of Epithelioma malpighien pavimenteux lobulé. The tumour, which was removed post-mortem, was found to have invaded periosteum and bone. Two years before the eye on the same side had been enucleated and it is suggested that the growth was secondary to a neoplasm of the epibulbar or conjunctival tissues.

A. G. B.

HUDELLET (G.). **Néoplasme de l'oesophage.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 363–364.

The patient was an emaciated native of 75 admitted to hospital at Dakar with acute bronchitis. He complained of pain behind the mid sternum which interfered with swallowing. Examination by X-rays, with the use of an opaque fluid, showed a funnel shaped collection which emptied slowly, at the level of the fourth dorsal vertebra. At autopsy a neoplasm was found, implicating the circuit of the gullet and leaving only a narrow lumen, and proved to be a lobulate pavement epithelioma.

A. G. B.

ARCHIBALD (R. G.). **A Case of Paget's Disease associated with Carcinomatous Infiltration of the Breast of a Male Native of the Sudan.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Mar. Vol. 1. No. 2. pp. 133–136. With 1 plate.

This case was one of co-existence of Paget's disease of the nipple in the male breast with carcinoma in a native aged thirty-five; which was primary is uncertain. Cancer is more prevalent in the Sudan than is supposed, the author writes, but he does not here give any details.

A. G. B.

APPEL (Fritz). **Ueber die Tropenmyositis, nach eigenen klinischen und histologischen Beobachtungen aus Fernando Póo.** [Tropical Myositis; Clinical and Histological Observations from Fernando Po.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. Nos. 6 & 7. pp. 163–182. With 9 charts & 2 text figs.; and pp. 195–211. With 2 plates & 2 text figs.

This is a long and careful essay on Tropical Myositis, based mainly on the clinical study of a large number of cases (65 are tabulated), on a few autopsies, and on a certain amount of histological investigation.

The disease is defined as an acute illness beginning, with or without any prior trauma, as a fever accompanied by symptoms of muscular rheumatism; but, without any other obvious symptoms, the patient is undoubtedly very ill, and generally has albuminuria. The fever may subside in a few days or weeks, without sequelae; but more often goes on to the formation of abscesses in the muscles—single or multiple, sometimes in successive crops. In the author's experience it does not occur in children under 12. It is a disease unknown in Europe and apparently also in America; a chart of its geographical distribution is given, showing its occurrence in those parts of tropical Africa and Polynesia which formerly belonged to Germany, and also in Tonkin and Fiji.

The author distinguishes several clinical varieties of the disease and gives short abstracts of illustrative cases:—(1) Acute non-suppurative; (2) acute suppurative; (3) acute suppurative with relapses (*i.e.*, successive crops of abscesses); (4) acute suppurative with pyaemia; (5) superacute, ending fatally before any suppuration can occur; in one of these cases all the affected muscles were observed p.m. to be infiltrated with a dirty-brown exudate. From histological investigations the author concludes that the primary feature of this disease is the formation of granulomatous foci in the myolemma of the striped muscles. Other organs (spleen) may be involved secondarily. In the early stages the muscular foci are infiltrated with a non-oedematous non-suppurative granulation tissue.

Giant cells or relics of filaria are never found in the foci; once only did the author find traces of a microfilaria of the perstans type. On the other hand in the pus of the abscesses staphylococci are a regular ingredient.

As to the causation of these foci the author discusses the theories which have been advanced, namely microfilarial, sporotrichotic, and bacterial, and, inclining to the latter, discusses further the Pasteurella (haemorrhagic septicaemia) and the staphylococcus theories, of which he inclines to the latter.

Differential diagnosis and treatment are also considered at considerable length, the question of treatment being mostly a matter of surgery.

[For previous papers on this subject see this *Bulletin*, Vol. 2, pp. 92 and 422; Vol. 3, pp. 281 and 317; Vol. 4, p. 130; Vol. 10, pp. 304–305; Vol. 13, p. 368; and Vol. 17, p. 242.]

A. A.

LAIGRET & LEFROU. **Les pyohémies à abcès profonds (à propos de 11 cas d'abcès profonds observés en A.E.F.).**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 459–476.

This paper contains an excellent account of the multiple deep-seated intramuscular abscesses (tropical myositis) met with in widely separated parts of the tropics, and a discussion of their aetiology, the whole being based on observations of eleven cases in French Equatorial Africa, which are recorded at some length, one of them having been a fatal case.

The clinical phenomena are discussed:—The extraordinary variability of the body temperature, which sometimes remains normal, but more usually shows a typical hectic curve with evening rise and morning remission; the sudden and rapid emaciation, which occurs even when there is no fever; the pain, diffused or localized, which is not explained by inspection; the localized induration in some muscle, revealed by palpation; the vagueness of the fluctuation which may be elicited when suppuration occurs; the extraordinary pus, almost always of a chocolate colour resembling that of liver abscess.

In nine of the authors' eleven cases suppuration occurred, and in every one of these nine they found a pure growth of staphylococcus. In two of the indurations in the fatal case they observed at the autopsy an intense infiltration of leucocytes between the muscular fibres.

Regarding the aetiology, the authors remark that they never found either Pasteurella or Filaria—always staphylococcus, with sometimes, in addition, little lumps of some fatty material. They refer to the observations of OUZILLEAU, KÜLZ, and WISE & MINETT [this *Bulletin*, Vol. 2, 92–3], and they admit that a filarial origin would account for the pathology and geographical distribution of these abscesses, and also that a dead filaria might supply a good base for a secondary invasion of staphylococcus. But they themselves have never found a filaria, and appear still inclined to regard the condition as a primary pyaemia without obvious point of entry.

As to the manner in which the staphylococcus may obtain entry the authors point out that the various mucosae are permeable, and also remark that though negroes may not be susceptible to boils they frequently suffer from lesions infected with staphylococcus.

As regards nomenclature the authors object to the obviously inappropriate pyaemia (pyohémies atténuées), and think that the term " myositis purulenta tropica " employed by the Germans in Cameroon best expresses the condition.

In treatment the authors recommend opening and cleaning out as soon as possible ; they themselves always practise drainage but think it may be superfluous, as the suppuration dries up very quickly when the abscess has been evacuated. They have used colloids by intravenous and intramuscular injection, without appreciable result ; and have also tried antistaphylococcus vaccine without much effect, but think that this line of treatment might be developed.

A good bibliography is appended.

A. A.

GIBLIN (W. E.). **Some Clinical Notes and Comments on Myositis amongst Papuan Natives.**—*Med. Jl. Australia.* 1922. July 15. 9th year. Vol. 2. No. 3. pp. 60–62.

Myositis is " fairly common " amongst Papuans. Of 906 persons admitted to the Samarai Native Hospital in 2 years 16 had myositis, the majority suppurative myositis ; all were indentured labourers. Apart from two or more cases the cause of which was evident, the etiology was uncertain. The disease is acute or subacute. The acute type starts with rigor, high temperature and severe pain in many muscles—arms, legs, back, buttocks and chest. Fluctuation may be detected in a week. As a rule, when the abscesses are opened the patient recovers. In the sub-acute type not so many muscles are affected—6, 4, 3 or only 1. Pus takes 2–3 weeks to become palpable ; fever persists and the patient emaciates. Recovery is complete. When suppuration does not occur high fever may persist for 3–4 weeks, and the indurated muscle, usually of the anterior abdominal wall or the pectoralis major, becomes supple again. The author finds that the British authorities regard these abscesses as filarial and he quotes MANSON-BAHR and WISE & MINETT in support of this view. WISE and MINETT found adult filariae within the ilio-psoas four times. MANSON-BAHR found them in various situations where suppuration had taken place but never, the author notes, in an intramuscular abscess. He did, however, grow staphylococci in four instances.

The author is inclined to regard this affection as myositis of specific origin and draws attention to an article in OSLER and MCCRAE'S " System of Medicine " (Vol. 5, p. 872 of the 2nd edition) on Primary Suppurative Myositis, which appears to correspond to the Papuan disease. It is defined as " a single or multiple muscle inflammation, mostly acute, of bacterial origin, presenting clinically the picture of an acute infectious disease and generally ending in suppuration." This disease was described from Japan in the last century as of bacterial origin. The Japanese regarded *Staphylococcus pyogenes aureus* as the specific cause and a similar disease was produced in animals. The author himself found staphylococci in the pus from three patients ; in others the pus was not examined.

[The reviewer was unaware of this article in OSLER and MCCRAE, which is probably not well known.]

A. G. B.

SÉZARY (A.) & ALIBERT (J.). **Deux cas de syphilis nerveuse de l'Européen dus au virus africain indigène.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. May 25. 38th Year. 3rd Ser. No. 17. pp. 816–818.

A contribution to the unity or duality of syphilis controversy. Two Europeans who were infected with syphilis by native women in North Africa, and had suffered from mucous plaques, subsequently developed undoubted tabes. According to LEVADITI and MARIE a neurotropic virus can be distinguished from a dermotropic, and it is well known that in North Africa affection of the nervous system is rare. In the instances given the same virus was both neurotropic and dermotropic. Reasons are given for the belief that the virus was really indigenous and had not been derived in the first instance from Europeans.

A. G. B.

CAWSTON (F. G.). **Freshly Dissolved Tartar Emetic in Venereal Disease.**—*Jl. Trop. Med. & Hyg.* 1922. May 15. Vol. 25. No. 10. pp. 126–127.

The author at Durban uses intravenous injections of 0·5 to 1·5 grains of freshly dissolved tartar emetic for gonorrhoea and soft sore, in which the discharge is lessened and the sore cleans, and for syphilis with or without other drugs. He notes its good action in three cases of keratitis, one of which had received arsenical treatment without benefit.

A. G. B.

HUCHARD (G. L.). **Quelques considérations sur l'emploi du "Trépol" dans le traitement de la syphilis.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 364–369.

Trépol, an oily suspension of tartrobismuthate of potassium and sodium, is regarded by the author as an energetic treponemicide with the drawbacks of provoking pain and stomatitis. He has used it by intramuscular injection in five cases at Dakar, two Moroccans and three Europeans. Two had stomatitis, all had pain, and three symptoms of poisoning. The author looks to better results in the future. FOURNIER and GUÉNOT have recently published a full account of the treatment of syphilis by bismuth [*Ann. Inst. Pasteur,* 1922, Jan.], and nine other references are given.

A. G. B.

BOMBAY. **The League for combating Venereal Diseases. Fourth Annual Report, 1921–1922.** [NORONHA (Socrates), M.O. in charge.] —22 pp. Bombay: League for combating Venereal Diseases, 66, Lamington Road, Grant Road. Printed by Silvester's P. Press.

We gather from the report that though this League is countenanced financially by the Bombay Government and the Bombay Municipality, what it considerably desires is to be allowed to work in some sort of official co-operation with the Health Department of the Municipality and the Municipal Dispensaries.

The report shows that the number of cases treated this year is nearly twice as many as in the year of inception (1918–1919), and that about 35 per cent. were sent by medical institutions of some kind. The several occupations of the patients are usefully tabulated; prostitutes head the list, and "unoccupied persons" follow in numbers that sufficiently exemplify the hackneyed line of Dr. Watts' hymn; married women infected after marriage are deplorably numerous. Forcible comment is made on the evil done by quacks of incredible boldness and plentiful lack of responsibility.

A. A.

HEINEMANN (H.). **Vergleichende Blutuntersuchungen mit den Methoden von Wassermann, Sachs-Georgi und Meinicke (DM). II. Mitteilung.** [Comparative Blood Examinations by the Methods of Wassermann, etc.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 11. pp. 323-334.

In a former paper [see this *Bulletin*, Vol. 19, p. 88] the author has recorded a series of comparative tests of the methods of WASSERMAN, SACHS-GEORGI, and MEINICKE. He now continues the record of these comparative tests, dealing with the serum of 2,000 Javanese labourers of both sexes. He finds in this, as in the former series, that the conformity of precipitin reaction is good, but that the conformity between complement fixation reaction and precipitin reaction is different from the European standard—a nonconformity that seems to be due chiefly to the influence of malaria.

A. A.

KÄYSER (J. D.). **Mededeeling omtrent het voorkomen van venerische ziekten in het Nederlandsch Indische Leger.** [On the Frequency of Venereal Diseases in the Dutch East Indian Army.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 4. pp. 401-408. With 3 charts.

Three graphs represent the percentages of venereal disease *in toto*, and of syphilis and other venereal diseases separately in the Dutch East India army from 1887-1919.

W. J. Bais.

i. NOC & KERNEIS. **Un cas de rage chez un Européen au Sénégal.** —*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Nov. Vol. 2. No. 9. pp. 263-264.

ii. CURASSON (G.). **Identification du virus rabique du Sénégal.**—*Ibid.* Dec. No. 10. pp. 279-280.

iii. HECKENROTH (F.). **Deux cas de rage humaine signalés à Tahoua, Niger. Leur valeur dans la question de la transmission à l'homme du virus rabique de l'A.O.F.**—*Ibid.* 1921. Mar. Vol. 3. No. 13. pp. 28-30.

iv. GAUTIER. **La rage au Dahomey. Extrait du rapport mensuel (novembre 1921) de la colonie du Dahomey.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Jan.-Feb.-Mar.-Apr. Vol. 20. No. 1. pp. 87-88.

i. The danger of rabies in West Africa is confirmed by the case of a European in Senegal who was bitten by a stray dog on the 18th July but did not go to hospital until the 30th August, although acute pains had recurred in the bite and the bitten limb on the 20th August, because he was assured that cases of rabies were unknown among Europeans in Senegal. When admitted he was suffering from spasm of the larynx and gullet, and he died 15 hours after admission in an agony of asphyxia. His dog, which had been bitten at the same time as himself exhibited no symptoms until the 15th August when it turned blind and became paralysed in one of its forelegs.

At the autopsy there was much acute oedema of the pia mater, and much fluid in the arachnoid spaces and ventricles. The temperature of the body persisted high two hours after death. Two guinea-pigs inoculated with the medulla wasted and suffered from respiratory troubles and died in 17 days; two rabbits became paralyzed on the 15th and 18th days and died on the 16th and 21st days individually.

ii. The virus was obtained from an indigenous (Senegal) dog that exhibited all the symptoms of the disease and died after an unusually prolonged paralytic phase. Half the dog's brain, emulsified, was injected into the jugular vein of a sheep, in four operations, at weekly intervals. About 40 days after the last injection half a cc. of a dilution of fixed virus was inoculated in part under the dura mater, in part into the anterior chamber of the eye of the sheep. Up to four months afterwards, when the sheep was sacrificed for another experiment, the animal never exhibited any symptoms attributable to hydrophobia. It appears, therefore, that the Senegal virus affords immunity to the fixed virus, and therefore (although the natural resistance of Senegal sheep to fixed virus is not exactly known) that the Senegal virus is of rabic origin.

In the discussion that followed, NOC observed that the existence in the Senegal dog of a disease having rabiform symptoms was well known, and that its differentiation from true rabies ought to be worked out, particularly as the Senegal virus, usually mild, could acquire increased potency under conditions still imperfectly understood.

iii. Until recently it has been held that the indigenous West African rabic or quasi-rabic virus could not be transmitted to man, and in harmony with this view it has been suggested that the undoubted cases of human rabies that have lately been observed in West Africa may be of extraneous origin. The author, while admitting the plausibility of this explanation, is hardly inclined to adopt it, on the grounds that it does not easily account for the isolated instances and the wide separation of the cases, and the occurrence of cases in the interior of the country, on the ground also that it postulates a rapid attenuation of the virus after its importation. He is rather inclined to think that the indigenous virus can be imparted to man under certain conditions, and that the rarity of human cases is due partly to the fact that the native dog is not very intimate with man, partly to the small percentage of contaminated bites among the bites that do occur, and, so far as the natives are concerned, partly to the non-recognition of human rabies as an effect of dog-bite.

iv. Record of two Senegalese children bitten by a rabid dog: one of them, bitten on the head, died of rabies three weeks afterwards; the other was sent to the antirabic institute at Dakar.

A. A.

HARVEY (W. F.) & ACTON (H. W.). **An Examination into the Degree of Efficacy of Anti-Rabic Treatment.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 852–889. With 2 charts in text.

But for the war this important paper, the drift of which is to call attention to the imperfection of existing standards for estimating the degree of efficacy of antirabic treatment, would have been published about seven years ago.

The authors, of course, do not impugn the propositions that the real mortality-rate of rabies—once the disease has declared itself—is 100 per cent., and that animals can be immunized against rabies before infection.

After describing the several methods of treatment that have been employed at the Kasauli Institute since its inception, they open out on a detailed criticism of the indefiniteness of mortality statistics of the disease.

The death-rates at antirabic institutions are merely death-rates of persons treated. But of the persons treated the data are inadequate. It is not known for certain in every case that they have been peripherally infected or have even run any risk of such infection ; for the saliva of a rabid dog (assuming the animal to be really rabid) is not *necessarily* infective ; and then, among patients coming to an institute for treatment, some may not have been actually bitten, but may merely have been in contact with rabid animals or their belongings, or with hydrophobia patients, or may have been bitten through protective clothing, or may have had the bite cauterized immediately. The authors' argument, in short, is that Pasteur Institutes in general show diminution of mortality due to " treatment " without any accurate definition of the condition treated. Furthermore, in many Pasteur Institutes the greater proportion of deaths may be excluded from the failures of treatment by limitations which if not exactly arbitrary are at any rate open to criticism ; as, for instance, by excluding persons who die later than 15 days after the completion of treatment, without giving information how late they arrived for treatment, and the duration of treatment.

If there is uncertainty of terms in estimating the death-rate among persons coming to institutes for treatment, there is even more uncertainty regarding the death-rate among untreated persons. In a given area how can it be known that all the rabid animals in existence have been reported, or even observed, and that all the wounds, however trifling, inflicted by rabid animals have been brought to light ? The tendency in statistics of the untreated is to overload deaths and to under-estimate risk, and so to exaggerate the death-rate. As a matter of fact it seems probable that the collection of statistics of the untreated is based largely on the occurrence of deaths from hydrophobia.

The authors are of opinion that statistics of results of treatment are probably more informative in Oriental countries, where the people are more likely to be bitten in the bare flesh and less likely to fly to an institute for treatment, than in countries where the population is well clad and more anxious.

We give here only the main drift of the authors' argument, which is set forth at considerable length and with all the formality of the statistical method. The formal conclusions of the paper are, briefly, that :—

" 1. The crude death-rates from rabies whether amongst treated or untreated should be corrected in accordance with the constitution of the population concerned.

" 2. We should have substitution, or at least inclusion of the total mortality rate in reports, which at present simply give failure rates.

" 3. The current ideas of the mortality occurring amongst the untreated are in need of revision."

A. A.

ARCHIVES DES INSTITUTS PASTEUR DE L'AFRIQUE DU NORD. 1922. June. Vol. 2. No. 2. pp. 259-272.—**Fonctionnement des Services de l'Institut Pasteur de Tunis pendant l'année 1921.**

Antirabic service.—The number of persons treated was 909 (780 the previous year). In the town of Tunis there were 213 cases. The writer condemns the carelessness of the inhabitants and police and does not foresee any improvement till the persons bitten take action for damages against the dog owners and the court inflicts a heavy fine. Of 901 bites, in 529 the owners of the animals were known. Apart from six persons who succumbed in the course of treatment, there were no fatalities. Since the inception of treatment at Tunis 10,433 persons have been treated with 24 deaths, a mortality of 0·2 per cent.

The usual details are furnished of vaccines prepared and analyses or examinations made.

A. G. B.

VAN LOON (F. H.). **Eenige gevallen van zenuwlijden na 'virus fixe' behandeling.** [Some Cases of Nervous Disease after Treatment with Fixed Virus.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 394–411.

Van Loon describes one case of disseminated myelitis and three cases of functional nervous disturbance, in all of which the symptoms broke out during antirabic treatment. As other causes were present to account for the nervous disease in each of the patients (influenza, malaria, pre-existing nervous lability), he considers the antirabic treatment in his cases as auxiliary in the etiology. He urges, however, that proper attention be paid to possible predisposing factors to nervous diseases in patients to be treated with antirabic vaccine, and that the treatment be carried out in a hospital if it seems desirable.

W. J. Bais.

i. DURANTE (G.) & ROY (J. N.). **Le Goundou.**—*Bull. et. Mém. Soc. anat. de Paris.* 1920. Vol. 90. pp. 587–591.

ii. BOTREAU-ROUSSEL. **Le Goundou.**—*Ibid.* pp. 612–614.

iii. TOURNIER. **A propos d'un cas de goundou.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Jan.–Feb.–Mar.–Apr. Vol. 20. No. 1. pp. 11–13.

i. Textbooks tell us that the goundou tumour consists of spongy bone covered with a thin layer of compact bone. According to Durante and Roy this is incorrect. They made a histological study of a specimen half a centimetre wide at the base and one centimetre in height, and so hard that it had to be decalcified. It was found to be composed of dense fibrous tissue, constituting two-thirds or three-quarters of the mass, and the remainder of thin bony lamellae. The fibrous tissue, disposed in whorls or parallel bundles, or reticular in appearance, was very vascular. The veins were normal, but the arterioles, particularly at points of bifurcation, were the seat of perivascular inflammation rarely affecting the muscular coat and doubtfully the epithelium. There were also inflammatory foci independent of the vessels. The cells were small, with round nucleus and very little protoplasm, or larger and epitheloid, representing a more sluggish reaction. Giant cells were not seen. The thin bony lamellae were irregularly scattered; they are of true bone, for they contain branched osteoblasts disposed in linear series parallel to the surface of the lamellae. There is no periosteal covering. The surface of the lamella is in direct contact with the neighbouring fibrous tissue; at certain points one can see the fibrils prolonged into the bone in the form of Sharpey's fibres. The lamellae do not appear to be directly connected with the subjacent bone, but to be separated by a thick fibrous shell (aponeurosis). The bony elements seem formed on the spot by metaplasia of fibrous tissue. The fibrous tissue does not represent a process of cure, but one of still active chronic inflammation.

The authors' sections allow them to affirm that in goundou it is not a question of a bony tumour but of an inflammatory lesion of chronic development. They do not think the bony lamellae are of periosteal origin ; periostitis, moreover, gives more compact exostoses. The process would rather be a medullitis, a true exuberant spongy chronic osteitis. Such inflammations come from feeble sources of irritation, from parasites less toxic than the usual cocci and bacteria. They discuss the relation of goundou to yaws and suggest that ritual incisions may serve as the portal of entry for the infective germs.

ii. The skeleton of a man of 15 from the Ivory Coast was shown, exhibiting tertiary framboesial osteitis of the long bones and the face (goundou). Death took place at an operation for the removal of the paranasal tumours. The skeleton is in the Dupuytren Museum in Paris.

iii. Recent works, such as those of BOTREAU-ROUSSEL and CLAPIER indicate that goundou is a hypertrophic osteitis and consequent on yaws [see this *Bulletin*, Vol. 10, p. 238, and above]. The author's case does not support this hypothesis. The patient was a boy of six who a year previously had a yaws eruption and six months later developed goundou. There was also osteitis of the lower jaw, the forearms, of the tibias, which were sabre-shaped, and of the bones of the tarsus, as well as pseudospina-ventosa. He had also double genu valgum, trophic troubles of the nails, Hutchinson's teeth and other dental malformations. He was treated with novarsenobenzol, ten subcutaneous injections, in all 5·1 gm. The other forms of osteitis disappeared, but the goundou was unaffected. In addition to the inefficacy of treatment, the author points out that goundou is very rare even where yaws is common, that its area of distribution is smaller than that of yaws, and that according to DURANTE and ROY goundou is neither an exostosis nor an osteitis, because the bony elements are independent of the nasal bone ; it is in their opinion an inflammatory new growth.

A. G. B.

CHASTANG. **Bubon climatique et lympho-granulomatose inguinale subaiguë.**—*Arch. Méd. et Pharm. Nav.* 1922. May-June. Vol. 112. No. 3. pp. 195-202.

The subacute inguinal lymphogranuloma described by DURAND, NICOLAS, and FAVRE (*Soc. Med. Hôp. Paris*, 1913, Jan. 31) is here compared with climatic bubo, which it closely resembles, but from which it differs (1) in generally being preceded by transient herpes-like ulcerations of the penis ; (2) in exhibiting successive foci of suppuration ; and (3) in not being preceded or initiated with bouts of fever. (Climatic bubo, again, besides being from the first a bubo apparently disjunct from any antecedent lesion, almost always occurs in little epidemics among people living under similar hygienic conditions.) The author inclines to the hypothesis that both these forms of granuloma have a mycotic origin. Both are of an intractable nature. Extirpation is not always efficacious, since it may be followed by prolonged oedema of the leg. Intensive iodine treatment has been recommended, or injections of a mixture of xylol (0·10 gm.), iodine or iodoform (1 gm.) and vaseline (90 cc.). RAVAUT, thinking that he observed amoebae in the pus of the lymphogranuloma, claims to have obtained rapid drying-up of the suppuration fistulae by intravenous injections of emetine [see this *Bulletin,* Vol. 18, p. 297]. DUFOUR and FERRIE, in a case of lymphogranuloma occurring in an old syphilitic and malaria patient, with albuminuria as a further complication, improved the condition of the urine with novarsenobenzol and completely cured the lymphogranuloma with intravenous injections of emetine along with tincture of iodine by the mouth—although they did not find either amoebae or bacteria in the pus.

A. A.

NICOLAI (A.) & STRAUB (M.). **Lymphogranuloom bij een Javaan.** [Lymphogranuloma in a Javanese.]—*Geneesk. Tijdschr. v. Nederl-Indië.* 1922. Vol. 62. No. 1. pp. 10–16. With 1 chart & 1 plate.

Reports a case of this disease, which is very rare in Javanese. The morbid anatomy is described in detail. Tubercular changes could not be detected, which is exceptional in such cases, as is the fact that the disease resembled a malignant growth rather than an inflammation.

W. J. Bais

KRAUS (R.) & DE LA BARRERA (J. M.). **Estudios sobre la fiebre petequial en Sud América. Las reaciones biológicas (Tercera Comunicación).** [Studies on Typhus Fever in South America. Biological Reactions (Third Communication).]—*Rev. Inst. Bacteriolog.* 1921. Mar. Vol. 2. No. 6. 48 pp. With 15 figs. & 12 charts.

Three main points are dealt with in detail : (1) the thermo-reaction ; (2) the serum reaction (Weil-Felix) ; (3) histo-pathological changes.

The work was undertaken partly with the object of finding out whether the disease, as met with in South America, is in all, or at least in all the important, points the same as that in Europe.

The experiments were carried out on guinea-pigs, since they were found to give as useful and reliable results as monkeys and were, of course, cheaper and more easily obtained.

Many controls were first made to determine exactly the normal temperature of guinea-pigs and from observations obtained from different places it was shown that this is variable within certain limits, but not enough to vitiate the experiments.

Four hundred and sixteen animals were inoculated and of these 270 reacted—64·90 per cent. After an incubation period of seven days as a rule (occasionally 14 or more), the temperature rose to 40·5° C. and was maintained for four to ten days. It is to be noted that it is not the rise of temperature alone which is important, but the rise after the period of incubation.

It was shown also that healthy guinea-pigs could be infected by contact with the sick, and this not by way of ectoparasites but directly by the skin or mucous membrane through minute wounds.

Before studying the Weil-Felix reaction in cases of typhus fever, the test was carried out with serum from healthy subjects and from those suffering from other diseases. In none of these was a positive result obtained in dilutions higher than 1 in 20. In typhus fever cases positive results were given in dilutions of 1 in 100 and upwards in 94 per cent.

In this section of the paper reference is made to the " anamnestic reaction," that is the lighting up or reactivation of latent agglutinins.

For example, in a patient who had previously suffered from enteric fever the Widal test showed an increase of agglutinins of *B. typhosus* when he contracted typhus ; the reverse also held good.

A consideration of the third point, namely the histo-pathological changes—the perivascular infiltration of the vessels of the skin and brain—are not specific, as they are indistinguishable from those found in encephalitis lethargica, poliomyelitis, rabies, and possibly other conditions also.

From a comparison of their results with the reports of the studies of European investigators, the authors conclude that the reactions obtained in typhus fever cases in South America are the same as those in Europe.

H. Harold Scott.

i. SERGENT (Edm.), FOLEY (H.) & VIALATTE (C.). **Iconologie des *Rickettsia* signalées en 1914 chez des poux infectés de typhus exanthématique.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1921. Sept. Vol. 1. No. 3. pp. 215–217. With 6 figs.

ii. ——, —— & ——. **Transmission de laboratoire du typhus exanthématique par le pou.**—*Ibid.* pp. 218–230. With 4 charts in text & 1 folding chart.

i. In June, 1914, these authors published a description of coccobacillary microbes found by them abundantly in the bodies of typhus-infected lice and never in control lice [see this *Bulletin,* Vol. 4, p. 490]. They had been described before by RICKETTS and WILDER, and have since received the name of Rickettsia. The authors now publish their figures, with a description of the appearances seen in lice at intervals in the course of the infection.

ii. In March, 1914, the authors published a brief account of the transmission of typhus to man and monkey by means of the bites of lice collected from a patient suffering from relapsing fever and themselves infected with spirochaetes, as well as by inoculation of young lice or of nits collected from the same patient [see this *Bulletin,* Vol. 3, p. 563].

These researches were interrupted by the war and the clinical histories of the patients are only now published. Three men, X, Y, and Z, were infected by lice or nits from the relapsing fever patient, another in a natural manner from one of these men, and three monkeys from lice collected from X during convalescence. The authors were working in Sud-Oranais in a native village well known to them where no cases of typhus had occurred for years, and, though they could not attain absolute certainty that the disease transmitted was typhus [the Weil-Felix reaction had not then come into use], they were themselves satisfied that this diagnosis was correct. Frequent blood examinations negatived a diagnosis of spirochaetosis. That infection may be passed on to the louse's progeny seems to be established. The paper, though belated, is of great interest.

A. G. B.

NICOLLE (Charles). **L'infection par le virus du typhus exanthématique est-elle héréditaire chez le pou?**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1921. Dec. Vol. 1. No. 4. pp. 433–436.

From having communicated typhus fever experimentally by crushing louse-eggs, taken from the clothing of a typhus fever patient, into an abraded skin, SERGENT, FOLEY and VIALATTE recently concluded that this infection could be inherited by the louse.

Nicolle, Blanc and Conseil, however, in 1914, from two experiments where large numbers of young lice, hatched from eggs issued from parents known by the experimental evidence of the faeces to be infected, failed to infect monkeys, concluded that the infection was not heritable.

Nicolle's explanation of the apparently contradictory experiment of Sergent and his collaborators is that the louse-eggs in their passage from the parent must have become contaminated externally by contact with the parent's infected faeces; and he holds to the conclusion that the infection of typhus fever is not proved to be transmitted from one generation of lice to another.

A. A.

i. Nénon (J.) & Bonnet (A.). **De la valeur de la séro-réaction de Weil-Félix du point de vue du diagnostic et du pronostic du typhus exanthématique.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 52–55.

ii. Senevet (G.). **La réaction de Weil-Félix et le pronostic du typhus exanthématique.**—*Ibid.* pp. 56–58.

i. In the epidemic of typhus which raged in Algeria in 1921, Nénon and Bonnet were struck by the constancy and high titre of the Weil-Félix reaction in abortive or mild cases, usually Arabs, and the late appearance or absence of reaction in grave cases, chiefly Europeans. The mild cases are often difficult to diagnose so that the reaction, usually obtained on the 8th–9th day, is a real help. The severe cases can generally be recognized clinically. The serum reaction seems to be a measure of the strength of the resistance to infection; when it is completely absent in a severe case death may be expected. The authors use the reaction for prognosis as well as diagnosis, and briefly recount a series of cases which support these propositions.

ii. Senevet thinks that Nénon and Bonnet are too absolute. He agrees with them in the main but gives figures from the 1919 epidemic showing that patients who succumb may give an intense reaction and, conversely, patients who recover may give none at all, so that prognosis must rest chiefly with the clinician.

A. G. B.

Shattuck (George Cheever). **Typhus Fever in Boston and a Review of the Newer Methods of Diagnosing Typhus.**—*Amer. Jl. Trop. Med.* 1922. May. Vol. 2. No. 3. pp. 225–250.

A useful article with 116 references, nearly all from Austrian or German sources. The author studied the case-books at the Boston City Hospital and reached the conclusion that in the preceding ten years 1–3 per 10,000 medical cases were typhus. The following are among his conclusions:—

"5. A Widal reaction positive in the dilutions generally used for diagnosis is commonly present in typhus fever and, therefore, it is not, *per se*, an obstacle to the diagnosis of typhus.

"6. The proteus reaction of Wilson, Weil and Felix is not an infallible, but a very valuable aid to diagnosis.

"7. The proteus reaction to be of value must be adequately controlled. Not only should controls be performed with the test, but it would seem necessary from time to time to check with known typhus serum the agglutinability of the culture used for the test.

"8. For interpretation of the results of the test, all known facts regarding it should be borne in mind and clinical evidence should be taken into consideration.

"9. Probably the surest means of diagnosing typhus fever during life is by means of histological examination of excised bits of skin.

"10. Pathological changes developing in the guinea-pig after inoculation with material containing the virus of typhus are believed to be constant but may be difficult to demonstrate.

"11. Somewhat similar lesions due to other causes may perhaps lead to error. Guinea-pig inoculation may be used for diagnosis.

"12. The point of greatest importance for diagnosis in the blood picture is the almost constant absence of leucopenia in typhus and its nearly constant presence in typhoid.

"13. The cerebro-spinal fluid shows an increase of cells which may be slight or marked. Failure to recognize this fact may lead to erroneous interpretation of the findings. Other changes usually found in this fluid are less important."

A. G. B.

LE BOURDELLÈS. **La pyothérapie aseptique dans le traitement du typhus exanthématique.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 387–390.

The author has formed a favourable impression of the treatment of typhus by injection of sterilized pus. He has tried it in 36 cases (32 natives and 4 Europeans) in a military hospital in Algiers, the patients being between 20 and 30 years of age; 9 of these cases were very grave.

One or two injections of 2 cc. of aseptic pus were injected daily, and no other treatment was employed except for the usual current symptoms. No unfavourable reaction to the injections, either local or general, was observed. Treatment began, variously, from the 5th to the 11th day, and the patients received, variously, from 2–13 injections.

The injection was followed almost at once by some remission of temperature, and then by general relief in the course of 24 hours, and subsequent rapid recovery—except in one case which was practically moribund when the treatment was started.

Whether antibodies are set free by the disintegration of the injected leucocytes, or whether alien leucocytes cause a useful shock, are the alternative theories of action suggested.

A. A.

DELAMARE (Gabriel). **La réaction de Friedberger dans le typhus exanthématique, la typhoïde et la fièvre récurrente.**—*Bull. Acad. Méd.* Paris. 1921. Nov. 29. Vol. 86. (3rd Ser.) No. 39. pp. 305–306.

According to FRIEDBERGER the subcutaneous injection of a small quantity of Proteus heated for two hours at 50° or 70° constantly provokes a reaction in enteric and other fevers but not in typhus.

The author tried this test in five cases of typhus, fourteen of enteric and two of relapsing fever, and concludes that it is far from being strictly specific.

A. G. B.

i. WALRAVENS (P.). **Note concernant la méningite à pneumocoques.** —*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 169–170.

ii. ——. **Etude sur le Pneumocoque.**—*Ibid.* pp. 241–244.

i. A note from the Bacteriological Laboratory at Elizabethville, Katanga. The author has recently diagnosed eight cases of pneumococcal meningitis in natives, in the course of 2–3 weeks towards the end of the dry season. They did not live together nor work at the same place. All died. The etiology is not always easily determined. The pneumococcus in the cerebro-spinal fluid cannot always be distinguished from the meningococcus even by Gram, but by seeding blood agar with the fluid assurity is reached. Cerebrospinal meningitis is not rare in Belgian Congo and many cases are certainly meningococcal, but the author notes that at the time these cases were recognized application was being made from the interior for anti-meningococcal serum.

ii. All the native workers in the great Katanga industries are vaccinated against pneumonia. The vaccine is prepared at Elizabethville from strains of pneumococci from LISTER's laboratory with the addition of strains from natives suffering from pneumonia or pneumococcal meningitis. The author sought to see whether the local strains corresponded or not with those of LISTER or American authors. He received from the Pasteur Institute, Paris, three samples of serum, corresponding with the American varieties I, II and III and one numbered IV, originating from a strain of pneumococcus isolated from Senegalese in France. Six strains of microbes came from LISTER's laboratory—A, B, F, G, H, K ; L, P, and P_2 were isolated at Elizabethville. The table shows the agglutination results. It is seen that three strains, G, K, and P_2, are agglutinated neither by the European serums nor by the Senegalese serum ; two of these strains are South African, one Katangan.

Agglutination reactions of various African strains of pneumococcus to serums supplied from Europe.

Strains of Pneumococcus.	Serum.	Agglutination.	Serum.	Agglutination.	Serum.	Agglutination.	Serum.	Agglutination.
A.	I. 1/25	+ +	II. 1/25	+ +	III. 1/25	+ +	IV. 1/25	+ +
	1/50	+	1/50	+	1/50	+ +	1/50	+
	1/100	+	1/100	+	1/100	+	1/100	−
B.	I. 1/25	+ +	II. 1/25	+ +	III. 1/25	+ +	IV. 1/25	+
	1/50	+	1/50	+	1/50	+	1/50	±
	1/100	+	1/100	−	1/100	−	1/100	−
F.	I. 1/25	±	II. 1/25	+ +	III. 1/25	−	IV. 1/25	−
	1/50	−	1/50	+	1/50	−	1/50	−
	1/100	−	1/100	−	1/100	−	1/100	−
G.	I. 1/25	−	II. 1/25	−	III. 1/25	−	IV. 1/25	−
	1/50	−	1/50	−	1/50	−	1/50	−
	1/100	−	1/100	−	1/100	−	1/100	−
H.	I. 1/25	+ +	II. 1/25	+ +	III. 1/25	±	IV. 1/25	−
	1/50	+	1/50	+	1/50	−	1/50	−
	1/100	−	1/100	−	1/100	−	1/100	−
K.	I. 1/25	−	II. 1/25	−	III. 1/25	−	IV. 1/25	−
	1/50	−	1/50	−	1/50		1/50	−
	1/100	−	1/100	−	1/100		1/100	−
L.	I. 1/25	+ +	II. 1/25	+ +	III. 1/25	+ +	IV. 1/25	+ +
	1/50	+	1/50	+	1/50	+	1/50	+
	1/100	−	1/100	−	1/100	−	1/100	−
P_1.	I. 1/25	+ +	II. 1/25	+	III. 1/25	+	IV. 1/25	−
	1/50	+	1/50	+	1/50	+	1/50	−
	1/100	−	1/100	−	1/100	−	1/100	−
P_2.	I. 1/25	−	II. 1/25	−	III. 1/25	−	IV. 1/25	−
	1/50	−	1/50	−	1/50	−	1/50	−
	1/100	−	1/100	−	1/100	−	1/100	−

Explanation of signs : + + agglutination strongly positive.
" " " + " positive.
" " " ± " doubtful.
" " " − " negative.

A. G. B.

LEJEUNE (E.). **Importance du pneumocoque dans la morbidité des troupes noires pendant la campagne d'Afrique 1915–1918. Conclusions pratiques a en déduire pour notre Congo.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 313–326.

It is an old story that the losses by disease in war exceed the losses by the enemy's fire. Among the black Belgian troops in the East African campaign the losses from pneumococcal disease alone had this preponderance, apart from dysentery, typhoid and cerebrospinal meningitis. Thus among 8,600 soldiers who took part in the 1917–1918 campaign the mortality was 6·5 per cent., of which 4·9 per cent. was due to disease and 1·85 to the pneumococcus (wounds, 1·6 per cent.). And in the Mahenge campaign, which lasted three months, the pneumococcus was responsible for 52 per cent. of the losses in soldiers, 58 per cent. in porters, and 50 per cent. in "boys." The troops were hardened by a previous campaign and largely selected, and the food was on the whole satisfactory, the only criticism being that the clothing of the porters was too light. However, in three months 15 per cent. of the force had become non-effective and of these casualties more than one-third owing to the pneumococcus. Acute broncho-pneumonia was the commonest manifestation, but there were many cases of arthritis, serous or purulent pleurisy and meningitis. Arthritis was especially common in the shoulder and the author states that though no bacteriological examination was made there was no doubt about the cause. The condition developed without much pain till the joint was full of fluid, which in the case of persons of low resistance, such as the porters, became purulent. There were 56 cases of pneumococcal meningitis, all diagnosed by the microscope, and synchronously 71 of the meningococcal form, apart from 36 that were of an undetermined nature.

The author treated the arthritis by repeated puncture, which he found to be as effective as free incision in cases in which destruction of the joint structures had not taken place. He recommends lavage with camphorated alcohol or serum. Similarly with pleurisy, repeated puncture aseptically done is best.

Of the 56 pneumococcal meningitis cases 14 certainly recovered, and of others evacuated to the rear there was no further word; probably the recoveries reached 50 per cent.

The author discusses the susceptibility of the African to the pneumococcus and thinks that its true cause has not been elucidated. He advises in general terms the use of pneumococcal vaccines, which he considers should be obligatory for troops and civil employees.

A. G. B.

INGRAM (A.) & CORSON (J. F.). **Notes on Certain Post-mortem Appearances of the Viscera in Pneumonic Infections of West African Natives.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 167–169.

The authors have been struck by the number of times at autopsies made at Accra, both during and since the 1918 pandemic of influenza, that they have found the liver to exhibit a boxwood or even a pale yellow colour, either with, or less commonly without, a pneumonic state of the lungs. The kidneys are generally swollen, the cortex pale; occasionally the tissues are jaundiced, and there are petechial haemorrhages beneath the serous membranes of the viscera and the mucosae of the stomach and intestines. The heart muscle is frequently flabby and the ventricles dilated. Sections of the liver stained with Sudan III and haemalum show much fat in the parenchymatous cells, especially in the central zone of the lobule; the cells themselves appear swollen and of indefinite outline; the nuclei may exhibit degenerative changes and stain badly. Section of the kidney shows cloudy swelling and granular degeneration of the cells lining the tubules, many of which contain small fat globules and are desquamating; petechial haemorrhages may be found. Their experience in fact tallies with that of JOUIN [this *Bulletin*, Vol. 12, p. 130] and they think that these cases are probably sequelae of influenza. Some of the changes closely resemble those of yellow fever and death in such a case, in which jaundice was present but no clinical history obtainable, might be attributed erroneously to yellow fever.

A. G. B.

BREFFEIL. **Note sur une épidémie de charbon humain en Guinée Française.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Dec. Vol. 1. No. 5. pp. 3–5.

An epidemic is briefly described, believed to be human anthrax, beginning with a boil or small abscess in the axilla or elsewhere, followed by fever with delirium, profuse sometimes sanguinolent diarrhoea and usually bloody vomit. All had partaken of the flesh of cattle which had died or were about to die of disease. Some cases, characterized by suppuration without internal symptoms, recovered.

A. G. B.

PEACOCK (W. L.) & DUKE (H. Lyndhurst). **A Case of Human Anthrax in Buganda Kingdom.**—*Lancet.* 1921. Aug. 13. pp. 332–333.

A case of anthrax in the Uganda Protectorate was recorded by SPEARMAN, 1917 [see this *Bulletin*, Vol. 10, p. 236], but objection was raised to the diagnosis owing to the absence of cultural confirmation.

In the present instance there is a full bacteriological report, with the results of inoculation of rats and a rabbit. The patient, a native, had a pustule on the jaw with great oedema but little pain. The case was promptly diagnosed and the lesion excised.

A. G. B.

DELAMARE (G.) & NOURY (Osman). **Sur un cas de farcin humain.**—*Bull. Acad. Méd.* 1922. Apr. 4. 3rd Ser. Vol. 87. No. 14. pp. 381–383.

The patient, a man of 35, a horse breeder, with a history of addiction to alcohol and of malaria, had an eight months' history of fever, later lancinating pain in one shoulder, and a nodule on the leg which suppurated after ten days. The pus infected a guinea-pig, from which the glanders bacillus was recovered. Later the patient had a large area of ulceration and a second nodule. The three phases—febrile, arthralgic and nodular—led to the successive diagnoses of malaria, rheumatism and gumma (syphilitic or mycotic), but none of these hypotheses withstood careful examination. Glanders is common in horses at Constantinople.

A. G. B.

VAN DEN BRANDEN & VAN HOOF. **La méningite cérébrospinale au Stanley-Pool.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Vol. 2. No. 1. pp. 21–35. With 5 charts in text.

An account is given of an outbreak of 14 cases of cerebrospinal meningitis at Stanley Pool in June–July, 1921, at the onset of the dry season. No case had been diagnosed bacteriologically in this region prior to 1917. Of the 14, 10 were infected with meningococci, the remainder with pneumococci. Owing to the overcrowding of natives in this locality and the lack of hygiene, vigorous measures were adopted. All the natives of Leopoldville and a large part of the population of Kinshasa were submitted to methodical disinfection of the upper air-ways by Coulomb's method.* A polyvalent anti-meningococcus vaccine was administered to native soldiers, workmen in the naval yards, and natives most exposed to infection ; 1,500 were thus treated.

The patients were strictly isolated and all their belongings were disinfected. All persons suspected from their symptoms to be carriers were isolated as far as possible ; an early case was thus recognized. The movements of natives were reduced to the minimum. A quarantine of five days was imposed at the river ports and persons concerned were submitted to Coulomb's method of disinfection. These measures were so successful that after three weeks there were no fresh cases. Notes of the 14 cases are given with five temperature charts. For the future the authors propose to vaccinate at the end of each warm season the natives most exposed to infection, workmen in crowded quarters, immigrants from neighbouring colonies where the disease exists, school children and troops, and they recommend measures to improve the conditions of existence of the natives in the crowded industrial centres at Stanley Pool.

A. G. B.

FRANCIS (Edward). **Cultivation of** *Bacterium tularense* **on Three Additional Mediums New to this Organism.**—*Public Health Rep.* 1922. Apr. 28. Vol. 37. No. 17. pp. 987–989.

"The writer now reports the cultivation of *Bacterium tularense* on (1) beef-infusion agar containing 0·02 per cent of an amino-acid (cystine) ; (2) beef-infusion agar plus a piece of fresh sterile rabbit spleen, and (3) Loeffler's blood-serum coagulated at 70° C."

A. A.

LEGER (Marcel) & BAURY (A.). **Pseudo-méningococcus pyogène isolé d'un abcès de la fosse iliaque.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 652–654.

The patient, a European, was admitted to hospital with moderate fever and an abscess in the iliac fossa, which was opened three weeks later. The pus evacuated suggested tuberculosis but no tubercle bacilli were found, and the inoculation of a guinea-pig was negative.

---

* Daily painting of throat for five days with Iodine and Pot. Iod., of each 10 parts, glycerine 100 parts ; at the same time inhalations of :—

Thymol	..	..	4 gm.
Guaiacol	..	..	4 ,,
Creosote	..	..	10 ,,
Alcohol	..	..	200 ,,

The organism isolated was a Gram-negative diplococcus, easily cultivated on the usual media and readily distinguished from the gonococcus and meningococcus. Its cultural reactions and in particular its power to ferment sugars separate it clearly from other described organisms. It would come close to *Diplococcus crassus* if this did not stain by Gram. Its cultural characters are set out at length.

A. G. B.

CARINI (A.). **Abcès de la région ombilicale dû à la pénétration à travers l'ombilic des semences de capim** (*Melinis minutiflora*). —*Bull. Soc. Path. Exot.* 1922. Apr. 12. Vol. 15. No. 4. pp. 215–219. With 3 text figs.

——. **Abcesso da região umbelical devido á penetração atravez do umbigo de semente de capim.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. Mar. & Apr. Vol. 5. 2nd Ser. Nos. 1 & 2. p. 63.

The patient, a carter with a firm at Sao Paulo trading in the seeds of fodder plants and especially "capim," presented himself with a small abscess just above the navel. Pus was let out and several bodies spermatozoa shaped, the head 1½ mm. long and the tail about 1 cm. The author was informed that such abscesses are not uncommon in workers with "capim" seeds and recognized that the bodies evacuated were indeed the seeds of the grass, *Melinis minutiflora*, found in pastures in Brazil. The workmen protect the navel with a pledget of wool secured by a belt or bandage. The seeds, which are figured, are provided with spines pointing towards the tail so that penetration of the skin is easy and retreat impossible. Moreover they are hygroscopic and as they take up moisture are endowed with movement which assists the penetration. It is stated that the workers with "capim" sometimes get conjunctivitis from the dust, and new hands suffer from fever.

A. G. B.

i. KERNÉIS (J.). **Observation clinique du malade qui a présenté l'infection à** *Pasteurella*.—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 495–497.

ii. LEGER & BAURY (A.). **Septicémie, avec localisation hépatique suppurée, due à un germe à l'aspect morphologique de** *Pasteurella*. —*Ibid.* pp. 491–495.

i. The patient in this enigmatical case was a soldier, and was admitted to hospital in Dakar with a history of copious vomiting of blood. Examination on admission showed nothing but an enlarged spleen and liver, the liver not being painful. During the next two days the condition was fair, the temperature being "moderate."

Suddenly on the 4th day the temperature shot to 40° C.

5th day: copious vomiting of red blood; profound prostration; nothing in urine or faeces; no pain in stomach or liver; lungs normal.

6th day: temperature falls to normal.

7th day: shivers; temperature goes to 40·8° C.; copious vomiting of grumous-bilious fluid with floccules of black clot; haemoglobinuria and melaena; icteric conjunctivae. No malaria parasites. No spirilla.

8th to 12th day: condition improves slightly, but temperature remains up.

13th day: shivers; temperature goes to 40·6° C.; critical sweats follow.

15th to 18th day: injections of "914" are followed by profuse sweats.

22nd day: considerable improvement; temperature though oscillating does not get far from normal; sleep good; appetite returns.

30th day: final injection of "914" is followed by complete defervescence; patient now extremely emaciated, but the pulse is good; spleen still enlarged and liver enormous; there is a little ascites; there is also some dullness at the right base, but no fluid follows an exploratory puncture.

35th day: shivers; temperature rises again to 48·8°; profuse sweats; death.

The only remarkable features of the post-mortem investigation are a diffluent spleen weighing 1·03 kgm., and for a liver an enormous "sponge of pus" weighing 3 kgm. and containing abscesses ranging in size from a pin-head to an orange.

ii. Blood-smears sent early from the above case disclosed nothing but a count of 80 per cent. polymorphonuclears and total absence of eosinophiles. A culture of the same blood in ordinary bouillon revealed a bacillus resembling Yersin's bacillus.

Pus from the liver sent after death contained a multitude of the same bacillus, which by appropriate investigation was shown to be *not* Yersin's bacillus.

The bacillus was cultivated in various standard media, without, however, revealing anything of its identity beyond that it would be classed by appearances with Pasteurella if it had not very different culture characters.

A mouse inoculated from a culture, by scarification, died in 74 hours, and the bacillus was found in its organs.

A brown rat, a white rat, and a guinea-pig were subcutaneously inoculated from a culture. An enormous tumefaction occurred in every case, which gradually disappeared in the course of three weeks. On the 30th day the brown rat (decumanus) died and the bacillus was found in its heart-blood and spleen. The other two animals were alive after 66 days.

A guinea-pig inoculated into the peritoneum from a culture died very quickly from peritonitis. Other guinea-pigs were severally killed at successive terms after inoculation, and the bacillus was always found in the heart-blood and organs.

" Le germe n'est pas le coccobacille de la Peste. On ne peut non plus le rattacher a aucune des *Pasteurellae* comme pathogènes pour l'homme."

A. A.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Ulcérations de la gorge dues à l'association fuso-spirochétique de Vincent. Observations faites au Congo Belge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 175–177.

In one of two cases which is described there was generalized swelling of the throat, soft palate, tonsils and base of tongue; false membrane was present and the tonsils were widely ulcerated. The condition was serious but yielded to injections of neosalvarsan. The diagnosis and treatment are discussed.

A. G. B.

PELTIER. **L'épidémie d'influenza qui a sévi en Nouvelle-Calédonie en 1921.**—*Bull. Office Internat. d'Hyg. Publique.* 1922. June. Vol. 14. No. 6. pp. 676–685. With 2 text figs.

New Caledonia appears to have escaped the influenza pandemic of 1918–19. In 1921 Noumea was infected probably by a ship from

Sydney and the explosion of the epidemic was due to the fêtes of a week later. The course of infection followed the two main routes from Noumea. The measures taken prevented a wide spread, and the north half of the island, which communicates with the south by sea only, remained free. The Loyalty Islands were contaminated by a ship's captain who made the voyage to New Caledonia against instructions. Of the epidemic, which was mild, a general account is given. In the neighbourhood of the capital 95 per cent. of natives and 50 per cent. of Europeans were attacked.

A G. B.

ACTON (Hugh W.). **An Investigation into the Causation of Lathyrism in Man.**—*Indian Med. Gaz.* 1922. July. Vol. 57. No. 7. pp. 241–247. With 3 plates.

Three species of lathyrus are considered to cause epidemic and endemic poisoning in man: *L. sativus*, *L. cicera*, and *L. clymenum*. In India the offending vetch is *L. sativus*, or kesari dâl, of which there are two varieties. It is eaten raw as flour or variously cooked, in times of plenty with wheat or rice, in times of dearth alone.

Lathyrism, a type of spastic paraplegia, is common in some parts of Central India and the United Provinces, as in North Rewah where the author's researches were made; he gives a rough estimate of 60,000 cases for that region alone. Two hundred and four patients, mostly stone-breakers, were examined (181 men and 23 women). According to the sufferers the onset in 170 cases was between the 15th and 30th year. All were of the lowest class, receiving a wage of two annas a day and during famine years being paid in kesari dâl. If they get lathyrism and cannot work on the land they have no livelihood but begging or stone-breaking. The author tried to discover an association between the year of onset and years of famine, but this, though probable, is not evident in the figures. Of the 204 cases, in 122 the disease came on in July, during the rains, and in none between December and March; the reason appears to be that the local crops are exhausted by March or April and kesari dâl is then imported; by October or November the local, small-grained, kesari dâl is gathered and this appears not to be poisonous. The high incidence in July is probably associated with the production of poisonous amines during germination. The great pre-disposing cause is the system of bondage known as the harwar system, which is described. The bondmen are taken on in May and usually receive their pay in food.

The onset is sudden, often while the men are at work. The gait is described in some detail with figures representing four stages, from the first in which the sufferer can walk without a stick, to the fourth in which he cannot rise from the ground. There is no paralysis, but a spastic condition affects the following muscle groups: the quadriceps extensor, adductors, gastrocnemii and posterior peroneals; the trunk amd upper limbs are unaffected. In the early stage the hesitating springing character of the gait—the patient walks on tiptoe—is characteristic. The body is thrown forward with each step. Later the knees are drawn one in front of the other (scissors progression); later again the knees are strongly flexed on the thighs, so that crawling is the only means of locomotion.

The bladder and rectum are unaffected; there is no ataxia. Ankle clonus and knee-jerk are increased, and on tapping the adductor muscles of the thigh a contraction occurs (adductor reflex).

As autopsies cannot be obtained the site and nature of the lesion have to be surmised from the symptoms. Thus the author reaches the conclusion that the lesion is below the second lumbar root, that both the cortico-spinal and strio-spinal systems are affected, but that whereas the lesion of the former is always partial the strio-spinal motor system may be completely destroyed.

The sudden onset suggests embolism, haemorrhage or thrombosis. The author thinks that the lesion is probably due to thrombosis cutting off the blood supply of the antero and antero-lateral tracts, which are relatively avascular, and causing degenerative changes which only partially affect the crossed pyramidal tract and partially or wholly the strio-spinal system, and as cause of the thrombosis he suggests arterial spasm.

He gives grounds for believing that the disease is not due to other vegetable products eaten by the natives, nor to adulterants of the kesari dâl. Moreover both STOCKMAN and he have produced the disease in animals fed on the vetch. He fed nine ducks on kesari dâl. Three which took the grain soaked for 24 hours in water became paralysed on the 18th, 20th and 22nd day; three fed on the grain washed in three changes of water showed no symptoms [duration of experiment not stated], nor did the third group which received in addition chopped vegetables, up to the 60th day. The poison is therefore water soluble. The author believes it to be an amine; it gives all or most of the alkaloidal tests as amines do, the amount of amines in the seed is increased during germination, which would explain the high incidence in July, many amines cause a decided contraction of involuntary muscle and blood vessels. The paralysis is permanent though some improvement may occur.

Preventive measures would consist (1) in the abolition of the harwar system; (2) in famine relief in bad monsoon years, and in control of the price of wheat and rice; (3) in increase in the knowledge of the disease, *e.g.*, removal of the poison by soaking, comparative safety of the small-grained variety, storage of grain in a dry place to prevent germination; (4) in improvements in agricultural methods. Lastly, if the State were opened up to concession hunters and the mineral wealth exploited, the peasants would not be wholly dependent for their livelihood on agriculture.*

A. G. B.

DE CASTRO (A. Bayley). **An Epidemic of Anasarca in the North Andamans.**—*Indian Med. Gaz.* 1922. Apr. Vol. 57. No. 4. pp. 132–135.

The epidemic of anasarca broke out in March with gastro-intestinal disturbance, followed in many cases by syncope and death, among free Ranchi coolies working for the Forest Department. It was studied by Dr. W. HUSSEY, whose report is quoted; 51 cases were reported with 8 deaths. In the camp concerned, malaria, dysentery, diarrhoea and fever (probably pappataci) were prevalent; spongy and bleeding gums were common. The symptoms were: swelling of feet, palpitation, dyspnoea, hemeralopia, digestive disturbances; no paralysis or disturbance of skin sensation. Cardiac dyspnoea was followed in two hours by death; pain in the loins was also a fatal symptom. Post mortem there was effusion in the serous cavities and the heart was in diastole. All the patients had been in the camp for 5–6 months; "their only food for about three months had been Rangoon rice, arhar dâl [pigeon pea], salt and a small portion of fresh vegetables once in 20 days": some probably had rice only, supplemented by jungle leaves and roots. The author had 14 cases under his own care, evidently less severe for none died. The symptoms are tabulated. He attributes the gum condition to the lack of mouth hygiene, and expresses the opinion that the disease was neither beriberi, nor scurvy, nor epidemic dropsy.

---

* In a paper published two months later on epidemic dropsy (*Ind. Med. Gaz.*, Sept.), Major Acton says that the large-grained kesari germinates in 24 hours, whereas the small did not after four days' soaking. During germination more than twice the amount of amine was formed in the large-grained variety, which explains its greater toxicity. The amine caused paralysis in mice.

A. G. B.

HUTCHISON (H. S.), with a Foreword by MURPHY (S. J.). **Rickets in India.**—*Glasgow Med. Jl.* 1922. Mar. Vol. 97. New Ser. Vol. 15. No. 3. pp. 145–158. With 2 figs. & 1 folding plan.

This is a study of rickets in Nasik, and it confirms the view held by FINDLAY, who, from his extensive experience in Glasgow, considers lack of fresh air and exercise as the main factor in the causation of this disease.

The author describes the population of Nasik [as indeed of India generally] as roughly divisible into two classes, namely a richer and better class, consisting of high caste Hindus and prosperous Mohammedans, who live well, and keep their women purdah; and a poorer class of Hindus and Mohammedans, whose diet consists chiefly of cereals and pulse, and whose women are not secluded (though the Mohammedans seclude them as much as they can); and he shows how much more prevalent rickets is among the former class, notwithstanding their good diet, rich in fat and milk, than it is among the latter class (particularly the poor Hindus, who do not practice purdah at all), whose diet is so poor and so deficient in fats.

The conditions of purdah life in Nasik are vividly described. The houses are in the congested area, there are no windows in the walls, inside is semi-darkness and stagnant air. In the fulfilment of maternity the woman may be mewed behind curtains in a dark corner for six weeks to three months. As there are no nurses the infant may not get its first breath of pure air in the open sunlight until it is six months, or perhaps a year old; and after its first formal introduction to the outer world it is not likely to go abroad again until it can look after itself in some fashion. Such are the conditions in the prosperous and well-fed classes.

The poorer classes, on the other hand, live for the most part in the outskirts, in huts that are far from airtight, and the women go out to work carrying their infants with them [as they do all over India], though with even the poor Mohammedans "purdah" is kept in view as a religious ideal.

In Nasik, among 380 children of well-to-do Hindus, the author found 146 cases of rickets; among 219 children of Mohammedans of all classes 62 cases; but among 650 Hindus of the poorer class 36 cases.

The incidence of rickets in the different classes of the community is shown in a series of tables, from which we may select the final summarized one [which includes also villages and towns in the Nasik district where "purdah" is not in vogue], as it is most intelligible to those who are not familiar with Indian religions and social distinctions :—

Class.	Children seen.	Cases of Rickets.	Percentage of frequency.
Children of Purdah Mothers ..	1,073	268	24·9
Children of Non-purdah Mothers	2,305	113	4·9

Another interesting point dealt with by the author is the occurrence of tetany in adults. All the cases seen by him in Nasik were women of the well-to-do class. In one particularly well-off family he found the mother (aged 33) and a daughter (aged 14) with late rickets and tetany, and the three younger children all with severe early rickets.

A. A.

MACKIE (F. P.). **Visceral Infections due to the Higher Fungi.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 781–786. With 5 plates.

Here are described a case of pulmonary aspergillosis complicating kala azar and two cases of streptothrix infection of the brain, all occurring in Mesopotamia. The first case was among those described by SPRAWSON and by Mackie in previous papers [see this *Bulletin*, Vol. 13, p. 346] as disseminated nocardiasis.

The patient had rigors uninfluenced by quinine, spleen four fingers' breadth below the costal margin and tender, signs of consolidation at the base of the right lung, emaciation becoming extreme, subcutaneous haemorrhages, transient patchy oedemas and a subcutaneous abscess. The illness lasted nearly six months. Tentative diagnoses were: enteric fever, tuberculosis of lungs, sub-diaphragmatic abscess, malaria, kala azar. A spleen puncture was negative and could not be repeated. In an attempt at blood culture for enterica streptothrix colonies appeared; the fungus was not pathogenic to animals and subsequently occurred as a contamination in plates exposed in the laboratory. At autopsy the lower lobe of the right lung was honeycombed with small abscess cavities, in films from which a fungus of aspergillus type was seen. The fungus was cultivated, and in a pigeon and a rabbit a local infection was produced. Sections from the lung are figured; the lung tissue was extensively invaded. In films from the friable spleen Leishmania were present in large numbers. The author thinks that the aspergillus infection may have dated back to the beginning of the clinical symptoms.

In the two other cases there was irregular or intermittent fever, headache, pain referred to the eyes and eventually coma or hyperpyrexia. In each instance there were small cerebral abscesses containing streptothrix mycelium, which was also ramifying in the abscess wall and inflamed cerebral tissue.

The fungus is well shown in the coloured plates.

A. G. B.

GONZALES (Eudoro). **Algunas observaciones sobre hongos parásitos encontrados en Venezuela.** [Observations on Parasitic Fungi met with in Venezuela.]—26 pp. With 2 plates. 1922. Caracas; Tipografia Americana.

This paper gives a brief account of the various fungi parasitic in man met with in Venezuela, and a more detailed description of the

Monilias and their morphological and cultural characters and pathogenic effects in laboratory animals, but does not bring forward anything original.

An account of a woman, 28 years of age, is given, who exhibited most of the signs and symptoms of tuberculosis of the lungs. The bacillus, however, was not discovered, but *Monilia tropicalis* was cultivated from the sputum. The symptoms all cleared up when large doses of iodide were taken.

M. intestinalis, cultivated in glucose broth, and inoculated (in a dose of 1 cc.) into the base of the tongue of a rabbit, did not produce any pathological results.

H. Harold Scott.

VAN DRIEL (B. M.). **Rhino-pharyngitis mutilans.**—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. 1 half-year. No. 16. pp. 1604–1610.

A woman presenting a typical picture of gangosa (healed with extensive scars of the face) was sent to the leper colony, Lao Simomo (Sumatra). Van Driel could not find any signs of leprosy, and after excluding lupus, kala azar and syphilis, made the diagnosis framboesia. The woman stated that she had suffered from yaws 12 years ago. The literature on gangosa is discussed and the author comes to the conclusion that the majority of gangosa cases are caused by yaws.

W. J. Bais.

NOGUE. **Un cas d'éléphantiasis du scrotum et de la verge avec gynécomastie consécutive.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. May. Vol. 2. No. 5. pp. 131–132.

A case of elephantiasis of the penis and scrotum in a native of 20 with a history of some 12 years' duration. The breasts were developed like those of a woman of the same age. Death took place from oedema of the lungs. There were three fistulous openings on the scrotum, from which urine escaped. The bladder was hypertrophied, the right kidney sclerosed, the testicles atrophied. The disease process had nipped the urethra in several places, and had thus caused cystitis, with subsequent infection of the kidney. To the testicular atrophy, the result at puberty of the constricting fibrous tissue, is attributed the secondary feminine character.

A. G. B.

KENNAN (R. H.). **Multiple Aneurysms in a Child.**—*Ann. Trop. Med. & Parasit.* 1921. Sept. 30. Vol. 15. No. 3. pp. 245–247.

MACFIE and INGRAM have described three cases of cardiac aneurysm in native boys of the Gold Coast in the causation of which malaria was suspected [see this *Bulletin*, Vol. 17, p. 422]. The present patient was a boy of four years, the son of American missionaries on leave from Sierra Leone. He had had about six attacks of fever in Freetown. Examination revealed nothing but some anaemia and four aneurysmal dilations, one at the site of the left hypothenar eminence, another just above, and two on the right side of the neck. These made their appearance in the course of six months or more and were undoubtedly arterial aneurysms. Blood examination showed *P. falciparum* and eosinophilia (12 per cent.). Several careful examinations of the faeces revealed nothing. Septic emboli, syphilis, and injury are considered as possible causes and set aside.

A. G. B.

GÄRTNER (Wolf). **Ueber die Häufigkeit der progressiven Paralyse bei kultivierten und unkultivierten Völkern. Eine statistische, biologische und Immunitätsuntersuchung ueber die Syphilis.** [The Frequency of General Paralysis in Civilized and Uncivilized Communities. A Research on Syphilis from a Statistical, Biological and Immunological Aspect.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1921. Vol. 92. No. 3. pp. 341–474. With 35 tables and 4 text figs.

As would be expected from the title, this paper is largely statistical, and is disappointing in that so many of these statistics apply to Germany or other European nations.

For many years the fact has been noted that general paralysis is rare among lowly civilized and native races, but no satisfactory explanation has been advanced. If the degree of civilization is the important factor, we ought to find the transitional stages on examining races or communities of increasing grades of civilization.

Syphilis among the less civilized races runs a more severe course, but tends in greater degree to affect the cutaneous structures than it does in the civilized, amongst whom the internal organs and nervous system are prone to attack. It has been noticed that patients with marked skin manifestations do not often develop nerve-syphilis, especially general paralysis, and, vice versa, the histories of general paralytics go to show that their attacks have been accompanied by little, if any, obvious (skin) symptoms of the earlier stages of syphilis. " Allergie " and immunity bodies are produced to a greater extent when the skin involvement is marked. The effect of early treatment is to avert, or clear up, if present, the skin symptoms, and thus leads to enhancement of the natural " allergic weakness," a predisposition to general paralysis, by suppression of natural antibody formation. This early treatment, including prophylactic, is frequent among the civilized, rare or wanting among the uncivilized. It is to be noted in this respect that it is not neglect of all treatment, but a course of partial adequacy only, *i.e.*, treatment intermediate between such as is sufficient to bring about a cure and one which is totally ineffectual, in other words, a course which has a certain effect on symptoms only, leaving the disease itself still active.

Another important factor on which stress is laid is the influence of febrile conditions. Fever and suppurative states have been noticed to exercise a favourable effect on the course of general paralysis. In fact, attempts have been made to bring about improvement by artificial production of fever, as by injection of tuberculin, by the use of vaccines, and even by the transference of malaria and relapsing fever. The fact that febrile conditions are common in the tropics accounts, in the author's opinion, in part at least, for the rarity of general paralysis in tropical races.

The questions of alcohol and of a special " neurotropic " virus are also mentioned, but only incidentally.

H. Harold Scott.

GROSSULE. **Empoisonnement par des ignames.**—*Ann. Soc. Belge de Med. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 159–161.

Six African natives, believed to have been drunk, ate tubers cooked in water of a species of yam. All had violent abdominal pain and five vomited the gastric contents ; one, a woman who did not, died in the morning. The five men were brought to hospital 48 hours later, when they were weak, with pale skin, cold sweat and small pulse. The next day they returned by their own wish to their village, 5 kilos distant, and on the way one died suddenly of heart failure. The yam in question is known to be very poisonous and wild pigs that eat it are said to die. The poison is eliminated by prolonged boiling.

A. G. B.

BAKER (C. R.). **Report of a Case of Shark Bite.**—*U.S. Nav. Med. Bull.* 1922. May. Vol. 16. No. 5. pp. 881–883. With 1 plate.

The unhappy victim—a strong well-developed young marine—bathing with some messmates at Cape Haitien (Haiti), dived into a large school of small fish. Almost immediately his messmates saw the tail of a shark, and about ten seconds later the poor fellow, coming to the surface, cried out " Brothers, the shark got me." He was able to swim a distance of about 12 ft. to a landing, whence, after the improvization of a tourniquet, he was rushed off in an ambulance to hospital, and there within about ten minutes his wounds were cleaned and sutured and dressed under ether. But though measures were taken to forestall shock, he died in shock within six hours. Though his wounds, which involved the left thigh from just below the great trochanter to the knee-joint, went right down to the bone, the actual loss of tissue was not co-extensive, and the sciatic nerve and femoral artery were uninjured.

A. A.

HEHIR (Patrick). **Effects of Chronic Starvation during the Siege of Kut.**—*Brit. Med. Jl.* 1922. June 3. pp. 865–868.

This interesting paper, here summarized in barest outline, places on record the state of nutrition and general health of the Kut force during the penultimate week of the siege, which lasted for the 148 days ended on April 29, 1916. It is noted that the 6th (Poona) Division, which made up the bulk of the garrison, reached Kut worn out by physical hardships. Details of the ration are given as regards proteins, hydrocarbons, carbohydrates and salts. The most serious deprivation was that of fats ; bacon and butter failed early, and the deficit was not met by the horseflesh, which was practically fatless. In April the issue of salt ceased. Tables of the rations issued on various dates, both for British and Indians, are given ; one notes that green-stuffs, herbs and grass, 2–4 oz., figure up to the end. The respective calories in March were 1,975 (British) and 1,550 (Indian), as against the normal of 3,600 and 3,100, and from April 12 onwards 1,850 and 1,110. On April 25, 15 men were dying daily, 5 from the direct effects of starvation and 10 from the same cause plus some simple malady. The author discusses the loss of weight —averaging 12·5 lb. for British and 17 lb. for Indians—the lowering of body temperature towards the end, the physical incapacity engendered, the inclination to sleep, the reduction of the pulse rate—by an average of nine beats per minute—and the mental attitude of the garrison.

The remarks on the chief diseases met with in chronic starvation are of special interest. *Diarrhoea* was the most prevalent disorder. On April 16 the author noted :—

" Early in April we began getting cases of very watery and severe diarrhoea with vomiting, cramps in the legs and abdomen, profound prostration, subnormal temperature, pulselessness, suppression of urine, and collapse. The majority of these cases rallied, but many of them became intensely collapsed and died on the second, third, or fourth day, some after a feeble attempt at reaction, most of them without manifesting any disposition to recover. I have seen practically all these cases ; they were not true Asiatic cholera, though clinically very like it. . . . In a large number of instances the stools were examined by a bacteriologist expert, Captain H. H. King, I.M.S., and in none were cholera spirilla discovered. . . .

" I was of opinion that the vast majority of these were ordinary cases of diarrhoea in men whose resistance had disappeared, whose stamina was greatly lowered, and whose heat-generating powers were so reduced that once a drain of any kind occurred from the body they were incapable of rallying ; the low state of vitality, and especially the absence of any fuel in the system, rendered resuscitation impossible or highly improbable. The condition is one of the common accompaniments of every lasting famine in India, and has during these famines been repeatedly mistaken for genuine cholera. In the terrible and widespread famine of 1877–78 in India this form of diarrhoea was responsible for the death of most of the famine-stricken."

There was much *dysentery*, slight or severe, the symptoms and course something like those of bacillary dysentery, but its bacteriology was not determined. *Chronic starvation debility* is defined as " a stage in chronic starvation from which recuperation cannot take place . . . all capacity to assimilate food has permanently disappeared." In many cases it passes imperceptibly into death.

Scurvy and *beriberi.*—As has already been published [see this *Bulletin*, Vol. 16, pp. 387 and 395], the British, fed on horseflesh and white flour, developed beriberi, whereas the Indians, refusing horse and provided with atta or coarse barley flour and dal (lentils), went down with scurvy.

Discussing the treatment of chronic starvation the author confirms the belief that the greatest caution is necessary in returning to ordinary food ; solid food is inadmissible, and only the most digestible fluids should be allowed. In point of fact the garrison on capitulation was put on the coarse rations of the Turk, chiefly brown rye bread and biscuit, which was responsible in May for 1,500 cases of diarrhoea and 200 deaths. The author was one and a half years regaining his normal weight.

A. G. B.

OGILVIE (W. H.). **Effects of Chronic Starvation during the Siege of Kut.** [Correspondence.]—*Brit. Med. Jl.* 1922. Aug. 5. p. 237.

The effects of chronic starvation here noted, which were observed in the Jubbulpore district during the famine of 1897, are irreparable atrophy of the glandular elements of the intestinal wall, signalized in children by atrophy of the buttocks. In children also cancrum oris was a common affliction.

A. A.

DIÉNOT. **Au sujet d'un procédé peu connu pour la conservation des objets en caoutchouc.**—*Arch. Méd. et Pharm. Milit.* 1922. June. Vol. 76. No. 6. pp. 728–729.

The author found that the substances usually recommended as preservative of rubber articles—talc, tallow and vaselin—were useless in the Algerian Sahara, where the summer temperature varies between 45° and 50° and describes a method of keeping them in an atmosphere impregnated with petrol fumes which was quite satisfactory.

A. G. B.

HOUSSIAU. **Notes de Thérapeutique Coloniale à l'usage des practiciens d'Europe.**—*Bruxelles-Médical.* 1921. Oct. 15. Year 1. No. 12. pp. 391–392.

The author advises his European colleagues on the use of emetine. He finds the best guide to dosage to be the onset of neuritis of the lower extremities. If there is decided difficulty in walking he counsels to reduce the dose or remit it for a week. As a result of the appearance of such symptoms in children of 4 and 15 months he does not exceed doses of 0·5 cgm. up to 6 months, 1 cgm. from 6 to 12 months, and 2 cgm. from 1–2 years.

In the tropics sounds and bougies become soft and often stick together. He finds an admirable substitute to be an elephant's hair. It is rigid, solid, and has an extremity of a fineness such as no bougie can attain. He has polished them with emery paper and has a series of different calibres. They never collapse and need little care. They can be boiled, but it is better to wash them with an antiseptic.

Finally, he warns his colleagues not to send to Tropical Africa anyone with a head injury which has damaged the brain or membranes. These persons when they contract malaria have violent headaches which often persist after recovery, and they soon suffer from cerebral irritability.

A. G. B.

HOFFMAN (Frederick L.). **Climate and Health in the South American Tropics.**—Reprinted from *Monthly Weather Review.* 1922. Jan. p. 9.

The author observes that much of what has been written on the tropical climate of northern South America is seriously misleading and a deterrent to the settlement of a vast region having enormous economic possibilities. He never suffered the slightest inconvenience from heat. The difficulties as regards health are not essentially climatic, but are concerned with food, clothing, housing and habits, all of which are subject to intelligent control.

A. G. B.

WU LIEN TEH. **The Effect of the Sun's Rays on Hats in Summer.**—*Nat. Med. Jl. China.* 1921. Sept. Vol. 7. No. 3. pp. 128–130.

The author at Harbin on August 1, 1921, took the temperature inside 24 varieties of hats for 20–30 minutes and tabulates the results. The thermometer recorded 110° in the sun and 92° in the shade. An English pattern of stiff straw hat gave the highest temperature, 110° F., and four varieties of helmet, khaki or white, the lowest, 98°–99°. It is concluded that the helmet, properly ventilated, is the best head-gear for summer in North China, and that the soft Tientsin straw hat made of hemp threads can be recommended. The stiff straw "boater" is quite unsuitable.

A. G. B.

PASKIND (H. A.). **Some Differences in Response to Atropine in White and Colored Races.**—*Jl. Lab. & Clin. Med.* 1921. Nov. Vol. 7. No. 2. pp. 104–108.

It has been observed that small doses of atrophin cause slowing of the pulse rate. The author compared the action of such doses in 20 white and 20 coloured patients, all suffering from venereal disease, otherwise well and comparable groups in all respects. After the injection of 1/60th grain under the skin the pulse rate in the white men became slower in five minutes, the slowest rate was reached in 10–15 minutes, and thereafter there was acceleration; after 1/30th grain slowing was very transient. In the negroes retardation was rare and, when it occurred, slight. The details show that whereas in the white man there was an average slowing of 10 beats per minute, in the negro the average was not greater than one beat per minute. This action of atropine is central.

A. G. B.

BEVIS (W. M.). **Psychological Traits of the Southern Negro with Observations as to some of his Psychoses.**—*Amer. Jl. of Psychiatry.* 1921. July. Vol. 1. No. 1. (Old Series, Vol. 78). pp. 69–78.

This paper is interesting, more particularly its statistics of the psychoses of the coloured patients in Southern State institutions in 1920. Of 2,732 cases admitted the following is the percentage analysis:—alcoholic psychoses, 0·5; cerebro-spinal syphilis, 6·0; paresis, 5·0; manic-depressive, 24·0; senile, 9·0; dementia praecox, 26·0. Of suicide, 5 cases only, 3 being male and 2 female.

A. A.

WOOD (E. J.). **Sir Patrick Manson: the Father of Tropical Medicine.**—*Amer. Jl. Trop. Med.* 1922. July. Vol. 2. No. 4. pp. 361–368. With 1 plate.

From this appreciative account we may extract the following perspicacious passages:—

"The death of Sir Patrick Manson in his seventy-eighth year will be regretted throughout the whole civilised world but especially in those vast tropical areas which either directly or indirectly have been so helped out of disease into health through his activities. In his earlier work he was a veritable torch-bearer making his own road as he went, for none had preceded him; but he carefully blazed the trail and now unknowingly or thoughtlessly every day in our work we travel that safe course laid out by him so many years ago unmindful of the difficulties and hardships which he met silently and alone. It matters not what branch of tropical medicine may interest us, we will not go far in it without seeing the wise part played in its early history and development by Sir Patrick Manson. His observations being made with the precision and accuracy which characterised all he ever did, remain in spite of the years, our safest guide.

"A review of his life and work furnishes a striking example of the possibilities of real achievement of a single life. Probably no man of his period accomplished so much and certainly no single individual ever did a greater amount of real creative work—work, which in the truest sense was original research and of a sort which proved to be of the most extraordinarily utilitarian character. . . .

"In itself Manson's discovery of the mosquito as an intermediary in the transmission of filariasis was of comparatively small moment, but measured by its effect on other problems it must ever be regarded as one of the greatest of the epoch-making contributions.

" There was no sham and no false pretense about Sir Patrick Manson as I knew him. His early difficulties, his mistakes, his ignorances and his lack of professional equipment to meet his problems were related in the frankest way. . . .

" The stranger soon threw aside his reserve in the presence of Sir Patrick Manson."

A. A.

JOURNAL OF TROPICAL MEDICINE & HYGIENE. 1922. June 15. Vol. 25. No. 12. pp. 155–168.—**Sir Patrick Manson as a Man of Science, as a Practitioner of Medicine, as a Helminthologist, as a Bacteriologist, as a Dermatologist, as an Observer, an Organiser.**

The chief interest of this " Special Manson Number " is an instalment of an autobiography dictated to Dr. L. W. SAMBON.

A. A.

HOFFMANN (W. H.). **Ein Denkmal für Carlos Finlay in Habana.**—*Berlin Klin. Woch.* 1921. No. 41. p. 1231.

A short note on the memorial statue of Carlos FINLAY recently unveiled in Havana. To FINLAY is due the credit of having been the first to suspect a causative connexion between *Stegomyia fasciata* and yellow fever, a theory which, when it was propounded by him in 1881, was beyond the grasp of most of his contemporaries. In claiming more than this incontestable honour for FINLAY, the author is injudicious.

A. A.

BRIDGES (D.). **Relation of Ankylostomiasis to Malaria.** [Report of Paper.]—*Brit. Med. Jl.* 1921. July 30. p. 149.

The report of this paper states that in the Federated Malay States malarial fevers are now as bad as, if not worse than, they were five years ago, notwithstanding all the antimalaria measures practised, and that the mortality is greater. Cases of ankylostomiasis were also more numerous both among native races and among immigrant Orientals. Arguing from the premises that ankylostomiasis lowers the natural resistance of the body, the author attributes the sustained prevalence of malaria and its present more fatal character to the concurrent ankylostomiasis, and suggests that one might go further and regard the worm as being as much responsible as the mosquito for the malaria. This is followed by a vigorous advocacy of methodical treatment of ankylostomiasis, particularly on the preventive side.

A. A.

ELLIS (Aller G.). **Betelnut Chewing and its Effects, including Cancer of the Mouth.**—*Arch. Intern. Med.* 1921. Sept. 15. Vol. 28. No. 3. pp. 252–267. With 1 text fig.

The author has studied his subject at Bangkok, where betelnut chewing is exceedingly prevalent. Much of the data he presents is the result of a questionnaire sent to 25 of his colleagues. After discussing in turn the various ingredients of the " chew " and the effects attributed to them by various writers, he sums up :—

" The chief or staple ingredients, therefore, are betel leaf, areca nut, black catechu, lime-turmeric paste and tobacco. Four of these, without including tobacco, have medicinal qualities. In physiologic action three of them are astringent. Other attributes possessed by or claimed for the substances collectively are those of carminative, tonic, stomachic, antiseptic, sialagogue, antidiaphoretic, vermifuge and dentrifrice. The effect of the mixture when chewed is moderately stimulating and exhilarating. The effect on the beginner is something like that of using tobacco the first time; giddiness and faintness occur but not nausea."

The chief local effects are on the mucosa of the mouth, especially that of the lower lip, which becomes denuded and furrowed, and the teeth. On these the coloured lime deposits and the concretion formed, first on or near the extremity, gradually extends over the root till at length a surprisingly short portion may be left uncovered. This is well shown in the illustrations of extracted teeth. There seems to be no doubt that betel chewing prevents decay of the teeth, but loss of sound teeth is common. The sequence of events suggested is pyorrhea, retraction of the gums, loosening of the teeth, but Dr. DAY, dentist at the Chulalongkorn Hospital, states that of the loose teeth removed by him in not more than 10 per cent. was pyorrhea exhibited. Other factors in the loosening of the teeth are the mechanical pressure of the concretions on the gums and alveolar processes, and the shifting of the line of pressure by opposing teeth from vertical to diagonal because of concretions forming unequally. The author is not prepared to gauge the importance of the three factors mentioned. Cleaning of the teeth would seem to lead to their less frequent loss. The constitutional effects of chewing seem to be slight.

The author made a bacteriological examination of the mouths of 20 patients and summarizes the results. Cocci, bacilli and spirochaetes were demonstrated in all and the red-coloured saliva was found to possess no bactericidal property.

Finally he sought to ascertain whether the common assumption of a relation of betel nut chewing to cancer of the mouth had any basis in fact. A study of the statistics of cancer at the hospital for six years showed that of 102 cases operated on 52 were cancer of the lower lip and of these 44 per cent. were in women. Thus more than half the cases affected the lower lip, which is injured by the chewing, and the sex proportion is in support of such a relation, for in non-betel chewing countries 90 per cent. of the lip cancers were in men, and only 10 in women. However, these figures are insufficient for demonstration, the author's conclusion being that betel nut chewing does not frequently cause cancer of the mouth, but there are reasons for believing that, in an as yet undetermined percentage of cases, it does lead to this result.

The most serious effect is the loss of teeth, and the author thinks that a thorough study of the mechanism of their loss and of its prevention is desirable.

A. G. B.

ACTON (Hugh W.). **Researches on the Cinchona Alkaloids.**—*Lancet.* 1922. Jan. 21. pp. 124–128. With 1 chart in text.

Fourteen alkaloids have been isolated from the various species of cinchona: the curative action of cinchona bark in malarial fevers is attributable to two series of crystallizable alkaloids. According to chemical constitution these may be classified as (1) natural alkaloids—cinchonine, cupreidine and quinidine, with their respective isomerids cinchonidine, cupreine, and quinine; and (2) hydroalkaloids severally corresponding with their respective natural alkaloids: these occur in very small quantities in most barks.

According to optical activity the two series may be classified as (1) dextrotatory—cinchonine, cupreidine and quinidine, with their corresponding hydroalkaloids; and (2) laevirotatory—cinchonidine, cupreine, and quinine, with their corresponding hydroalkaloids.

This paper is to demonstrate that in their pharmacological as well as in their optical and chemical relations the alkaloids show the same respective correspondence. The pharmacological action has been tested for toxicity to mammals, protozoa and bacteria; on digestive enzymes; for local effects on tissues; and for effects on blood and blood pressure.

The toxicity for paramoecium [see this *Bulletin*, Vol. 19, p. 103] varies with the pH of the medium, being greater in an alkaline than an acid medium.

On digestive enzymes the cinchonine series are more inhibitive than the cinchonidine series. The inhibition is most with trypsin, less with pepsin, and feeble with erepsin. The stronger the concentration the greater the inhibition; therefore the alkaloids should be well diluted and large doses should be avoided. The inhibition is less when the ferment is first allowed to get well to work; therefore the alkaloids should be given after a meal—½ to 2 hours after. The commercial sulphates should always be given with acids as they exhaust the free HCl of the stomach and thus further inhibit pepsin.

The eschar produced at the site of injection of quinine is a necrosis caused by strong acid solutions and precipitation of quinine base. A negative chemotaxis of leucocytes persists as long as unabsorbed alkaloid remains. The cinchonine series seem to be less anaesthetic to rabbit's cornea than the cinchonidine series.

It is well known that acid salts of quinine are haemolytic; but quinine base is not haemolytic. "The advocates of the quinine blackwater theory will now have to turn their attention to the various decomposition products of this alkaloid."

The fall of blood pressure that follows intravenous injection of quinine is well known. The depressor effect in all the cinchonine series is greater, being greatest with quinidine—the effect produced by injection of 1 mgm. of which is equal to that produced by 10 mgm. of quinine. There will be danger therefore in intravenous injection of quinidine in large doses or to the young or feeble.

The action of cinchona alkaloids on the uterus under different conditions is experimentally studied. One conclusion is that doses of quinine large enough to be poisonous would be required to cause miscarriage.

General conclusions are that the dextrotatory alkaloids (cinchonine series) are more powerful than their laevirotatory isomerids (cinchonidine series); that the hydroalkaloids are stabler and more active in many respects than the natural alkaloids; and that the higher members of both series are more toxic to mammals, protozoa and bacteria than the lower members.

In the introduction reference is made to a certain confusion in the nomenclature of the alkaloids resulting from the standard of nomenclature being established before the relation between optical activity and chemical constitution was known. Also to the fact that in benign tertian malaria the dextrotatory quinidine is more efficacious than the laevirotatory quinine.

A. A.

ACTON (Hugh William) & KING (Harold). **The Nephelometric Estimation of Quinine in Blood.**—*Biochemical Jl.* 1921. Vol. 15. No. 1. pp. 53–59.

The authors refer to the observations of MORGENROTH [see this *Bulletin*, Vol. 13, p. 81], who showed by physiological methods that quinine is held by, or stored in, the red corpuscles and that the surrounding plasma constantly contains a much lower proportion, and to those of RAMSDEN, LIPKIN and WHITLEY, who found that the distribution of quinine was in favour of the serum by 3 : 1 [*loc. cit.* page 92.] They were unable to get reliable results by the nephelometric method of RAMSDEN and LIPKIN, as described by them, until they had considerably modified it. The result of their experiments was to show that the distribution between corpuscles and serum is approximately equal.

A. G. B.

CRAWFORD (J. Hamilton). **The Solubility of Quinine Hydrochloride.** —*Brit. Med. Jl.* 1922. June 3. pp. 874–875.

The hydrochloride of quinine is 20 times as soluble in water as the sulphate. In the intravenous injection saline or Ringer's solution is likely to be used, so the author, who writes from the Department of Pharmacology, University of Edinburgh, tested the solubility of the quinine salts in these solutions :—

Distilled water dissolved 1 part neutral hydrochloride in	35 parts.
Saline solution dissolved 1 part neutral hydrochloride in	100 „
Ringer's solution dissolved 1 part neutral hydrochloride in	110 „

(The Ringer's solution contained 0·85 per cent. NaCl the same proportion as the saline).

With Ringer the solubility lessens as the age increases, and if the solution is allowed to stand the quinine precipitates ; hence the the advantage of freshly prepared solutions. Tests of the acidity of acid quinine hydrochloride and of quinine and urea hydrochloride showed it to be practically the same ; each substance is equally soluble and the quinine and urea hydrochloride appears to possess no advantage over the acid salt.

A. G. B.

NEUMANN (Alfred). **Ueber Nekrosengefahr bei subkutanen Chinininjektionen.** [The Danger of Necrosis in Subcutaneous Quinine Injections.] —*Wien. Klin. Woch.* 1921. Aug. 25. Vol. 34. No. 34. p. 414.

The author prefers the hydrochloride of quinine in solution with urethane to the bihydrochloride for " subcutaneous " injections, as leading less often to necrosis. He refers to the work of DUDGEON and probably has in mind the mode of administration usually called " intra-muscular. "

A. G. B.

ABRASSART (M.). **Un cas d'intolérance quinique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 149–151.

A month before his departure for a malarious country the patient took, experimentally, a tablet of 25 cgm. of bisulphate of quinine. Result—generalized swelling and redness of the skin, pain in head and back with feeling of prostration, fever, followed by a rash which was morbilliform or scarlatiniform according to the region. The symptoms persisted three days. A month later, arrived at Elizabethville, he repeated the dose with the same results but more severe and of more rapid onset; the rash lasted a week. Ten days later the author gave him 2½ cgm. by the mouth; after a few hours he had a chill and fever, and the same treatment was followed by the same effects on the two succeeding days. Later the skin desquamated. Three months later the patient was taken into hospital and treated thus: adrenaline in 30-drop doses was given for five days, the patient was purged and took benzonaphthol and bicarbonate of soda in powder. On the test day chloride of calcium was given, an injection of 1 cgm. of quinine and, one hour later, 25 cgm. of the hydrobromide by the mouth. There was redness of the skin and some swelling, but no malaise. Later he received by injection 1 cgm. of quinine with half a mgm. of adrenaline, and an hour afterwards an intramuscular injection of 40 cgm. hydrochloride. Result—generalized erythema with pruritus but nothing more. Three days and again two days later the same procedure, but the second time the test dose was raised to 1 gm. Two days later he was able to take the ordinary dose by mouth of 25 cgm. and has continued to do so since.

Commenting on the case, the author points to the greater intolerance to oral than to intramuscular quinine, the increase of susceptibility when small and decreasing doses were given if the interval was at least a week, and the apparent efficacy of the preparatory treatment. He thinks that all candidates for the tropics should, before leaving home, undergo a quinine test.

A. G. B.

BRODEN (A.). **Intolérance à la quinine.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 153–157.

Two cases are here described.

A young doctor had unpleasant symptoms after taking an "antineuralgic" cachet, reported to contain quinine. As he was intended for a tropical career it was necessary to test his tolerance. A dose of 10 cgm. of the hydrochloride was followed by lively itching, preventing sleep, and general erythema. He was then advised to take 1 cgm. daily, increased every third day by the same amount. Apart from an attempt to increase the dose more rapidly, with prompt symptoms of intolerance, this course was followed with success, and when the dose reached 15 cgm. it was safely augmented every third day by 2 cgm. When he left for the Congo he could take 40 cgm. daily, and he stayed in Africa uninterruptedly for seven years.

In the other case the intolerance was acquired. The patient, a man of 30, lived in Belgian Congo from 1911 to 1913 without fever and took 25 cgm. of quinine twice a week without inconvenience. After a period of leave he returned and shortly after had an attack of fever followed by haemoglobinuria. A fortnight later the fever relapsed, he took 25 cgm. of quinine and two hours later had a relapse of haemoglobinuria. A month later the same sequence of events. Later, having fever, he was persuaded to take 50 cgm. and had another haemoglobinuric attack. At Leopoldville the same experience was repeated and the patient was invalided. An attempt was made to treat him in Europe with 1 cgm. doses of the hydrochloride, but on two occasions this was followed by fever and malaise and he refused to persist.

The author suggests that intolerance did not develop till the patient was infected with malaria, and warns his readers of the caution necessary in treating haemoglobinuria during and after the crisis.

A. G. B.

CHABAUD. **Sur un cas d'anaphylaxie à la quinine.**—*Arch. Méd. et Pharm. Nav.* 1922. July–Aug. Vol. 112. No. 4. pp. 337–340.

A child of nine, born at Saigon, had malaria (parasites found) at the age of three yielding to quinine and again at six after a visit to France.

In November, 1921, she had fever for which an injection of quinoform, 0·25 gm., was given. Result—violent headache, colour red passing to violet, respiration very difficult, and appearance of impending death. These symptoms ceased after 15 minutes but were succeeded by headache, urticarial eruption with intense pruritus, and respiratory embarrassment. The author consequently endeavoured to desensitize the patient, commencing with an injection of 1 mgm. Anaphylactic symptoms were produced by any dose greater than 2 mgm., and this amount was given daily with enemata of arsenobenzol every five days. Then, since the attacks of fever were increasing, 0·25 gm. quinoform was injected, with the result a few minutes later of rigor, cough, and intense respiratory difficulty necessitating a call for oxygen.

It was now decided to give a small " vaccinating " dose an hour before the exhibition of the therapeutic dose. An injection of 0·01 gm. quinoform was followed after an hour by one of 0·49. The next day 0·02 and 0·48; the next 0·04 and 0·46; the next 0·10 and 0·40, repeated for five days; the next 0·20 and 0·30; till on the eleventh day 0·50 gm. was injected without the preceding dose and no untoward symptoms followed. Thereafter resort was had to cachets of 0·25 gm., and in January the child was quite recovered and taking her quinine regularly.

A. G. B.

KERAMOPOULOS (E.). **La méthode des transfusions sanguines et la prophylaxie des accidents quiniques.**—*Presse Méd.* 1922. June 24. Vol. 30. No. 50. p. 544.

In September, 1920, the taking of quinine for malaria was followed by dyspnoea, faintness and general urticaria. In November and February the same sequence of events. Meantime the patient's condition became worse, and by September the spleen had increased in size and anaemia became very evident. Injections of arsenobenzol, 0·15 gm., and of collargol had a similar effect to quinine. In October a subcutaneous injection of quinine was preceded by an intravenous of normal saline containing carbonate of soda, but with the same result. Transfusion of blood was then undertaken. Every second or third day 20 cc. was transfused from the patient's daughter to his own veins. The general state improved steadily and a month later the red cells and haemoglobin count had risen and the weight had increased by two kilos. In November 10 cgm. of hydrochloride of quinine was well borne, and a fortnight later a gramme in two doses was being taken daily.

A. G. B.

SCHMIDT (Hans). **Das Antimon in der neueren Medizin: die Literatur 1906–1921 in Referaten.**—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. Beihefte I. pp. 1–68.

In this useful brochure brief summaries of 300 papers, published in the last 15 years, on the uses of antimony in medicine are assembled and classified, from PLIMMER and THOMSON's important paper: " Further Results of the Experimental Treatment of Trypanosomiasis in Rats "—important because it introduced the era in which antimony came into its own again—to quite recent publications. The diseases concerned are trypanososomiasis, human and animal; spirochaetoses —syphilis, yaws, relapsing fever; leishmaniasis; malaria; leprosy; ozaena; granuloma venereum; bilharziasis; filariasis; and in an appendix is similarly recorded the employment of antimony in recent years in veterinary medicine.

In the introduction an interesting survey is given of the esteem, or the reverse, in which antimony has been held through the centuries. Gray antimony ore was used from the earliest times in the East as

" eye-salve " for protection against endemic eye diseases and, according to REUTHER for Oriental sore. Theophrastus PARACELSUS seems to have popularized its use to an extraordinary extent; and in 1604 Basil VALENTINE published his "Trumphant Chariot of Antimony" in which the action of the drug in syphilis, leprosy, plague, cancer, malaria and other diseases and conditions was described. Louis XIV's recovery from typhoid fever in 1657 was attributed to tartar emetic, and the same monarch in 1720 paid a high figure for the secret of *Poudre de Chartres*, a decoction of antimony with potash, but the use of antimony declined till in 1900 tartar emetic was employed to a small extent only, as an emetic and expectorate. As is pointed out, it is research in tropical medicine which has not only reintroduced antimony but precised its parasiticidal value. Of the many preparations known to the practitioners of the middle ages tartar emetic, and the corresponding sodium salt, alone have made good, and oral administration has given place to intravenous. Organic compounds such as stibenyl are now on their trial.

A. G. B.

KORNS (John H.). **Toxicity of Antimony in Rabbits.**—*China Med. Jl.* 1921. Nov. Vol. 35. No. 6. pp. 564–566.

With a view to ascertaining the effect of long continued use of antimony and of determining which form of the drug is least toxic, the author injected a series of rabbits with solution of either potassium antimony tartrate, or the similar sodium salt, or colloid antimony trisulphide, and tabulates the results. Some rabbits received 40 injections in a period averaging 110 days without harm during life or changes in the tissues at autopsy. The preparations were about equally toxic in excessive dosage. - Reasoning from rabbits to kala azar patients the author suggests that a larger total amount of antimony is admissible than is generally thought and that the dose may be quickly pushed to the maximum.

A. G. B.

SOCA (F.). **A propos d'un cas de polynévrite émétinique suivie de mort.** —*Bull. et Mém. Soc. Med. Hôpit. de Paris.* 1922. May 18. Year 38. 3rd Ser. No. 16. pp. 768–771.

The author, Professor at Montevideo, writes that whenever he reaches the dose of 8 cgm. of emetine hydrochloride repeated on several successive days, signs of poisoning compel him to stop the drug.

He details the history of a patient admitted to hospital for supposed amoebic dysentery who, between March 16th and April 3rd, received 1·05 gm. (maximum dose 9 cgm.). Nine days later there was loss of strength and pain in the limbs, walking was difficult, pulse 130–145. Difficulty in swallowing is also mentioned and cardiac dyspnoea. The pneumogastric nerve was tender to pressure. A search for emetine in the urine on one occasion was negative. By April 17th there was decided improvement and on May 8th not much the matter, but on the 20th the patient got suddenly worse and died with bulbar symptoms. The author regards the neuritis as peripheral and not of central origin.

A. G. B.

ARRILLAGA (F.). & GUGLIELMETTI (J.). **Action du chlorhydrate d'émetine sur le coeur.**—*C.R. Soc. Biol.* 1921. July 23. Vol. 85. No. 27. pp. 596–597.

As a result of experiments on frogs and dogs the authors find that emetine hydrochloride must be regarded as a cardiac poison. It often produces auricular-ventricular dissociation. It exerts its action on the excitability and conductivity of the heart. In most cases death is accompanied by auricular fibrillation. The venous way should not be employed in therapeutics because it exposes the patient to cardiac accidents and has no real advantage.

A. G. B.

BAIS (W. J.). **Dood door emetine.** [Death from Emetine Poisoning.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1921. Vol. 61. No. 5. pp. 500–504.

A fatal case of emetine poisoning in a Javanese woman, the total quantity of the drug administered being only 1,080 mgm., divided over three series of six injections each of 60 mgm. in six weeks.

The clinical symptoms, muscular weakness and acceleration of the pulse, only became apparent two days after the last injection given. Post-mortem the most important lesion detected was a serious parenchymatous degeneration of the heart muscle.

W. J. Bais.

AKAMATSU (Muneji). **Ueber die pharmakologischen Wirkungen des Oleum Chenopodii.**—*Kyoto Igaku Zassi.* 1920. Sept. Vol. 17. No. 10. [In Japanese pp. 1154–1166. German summary. pp. 79–80.]

The following is an abstract of the German summary of the action of oil of chenopodium as investigated by Akamatsu : In the earthworm the muscle is excited to strong tonic contraction. The isolated uterus of the rabbit and the isolated small intestine of the dog and cat are stimulated by weak emulsions, and are first stimulated and then paralysed by concentrated emulsions, but the isolated small intestine of the rabbit is paralysed from the first. The poisoned gastrocnemius of the frog reacts more strongly to electrical stimulation but tires more quickly (than the control). The isolated frog's heart is paralysed in diastole.

A. A.

NORWOOD (B. F.). **A Case of Poisoning by Oil of Chenopodium.**— *U.S. Nav. Med. Bull.* 1921. Oct. Vol. 15. No. 4. pp. 818–823.

The patient, a sergeant of the U.S. Marine Corps, was admitted for amoebic dysentery microscopically diagnosed. He received, by error, minims having been understood as mils by a subordinate, 11 measured mils of oil of chenopodium in 20 mils of castor oil within two hours, 10 mils at a single dose.

Within 30 minutes there was complaint of ringing in the ears and dryness of lips and tongue. The pulse rate was 60, the respirations 11, shallow. The condition verged on collapse. Active therapeutic measures were instituted. Three hours later he became semi-stuporous and quite deaf, with marked prostration. On the 2nd, 3rd and 4th days he was in a state of stupor from which he could not be roused. Deglutition became difficult and the bowels did not act. The pupils were sluggish and slightly unequal, the temperature 103·2°, the respiration extremely shallow, the pulse irregular and weak. On the 4th day there was active delirium and the evacuations were passed in the bed. Owing to difficult deglutition it was not easy to give nutriment by the mouth. On the 5th and 6th days delirium was maniacal. On the 7th general collapse was feared and the prognosis was grave; on the 8th there was slight improvement and on the 9th consciousness returned. Delusions and hallucinations continued and extreme deafness persisted. Thereafter recovery gradually took place. The hearing became normal at the end of the 4th week. Blood-pressure observations were not made.

Weekly examinations for 10 months failed to reveal amoebae.

With respect to dosage, the author observes that a drop is not equivalent to a minim and that drops vary with the dropper and other factors. With a number of droppers he found that the number of drops to a mil varied from 36 to 45, the inference being that the measured dose is the safe and reliable dose. Reference is made to SALANT's paper [this *Bulletin*, Vol. 12, p. 195].

A. G. B.

EVERS (Hans). **Schwere Hörstörungen nach Chenopodiumgaben.** [Grave Disturbance of Hearing after Chenopodium Administration.]—*Deut. Med. Woch.* 1921. July 28. Vol. 47. No. 30. pp. 857–858.

The patient was a woman of 40 years. Her general condition was feeble and her haemoglobin content 57 per cent., and for five years she had suffered from spasmodic indigestion, suggesting slight kidney trouble. Her hearing had always been good, and there was no disease of the ear. Ascaris eggs having been suspected or reported in the stools, she was treated for worms. On a given day, at intervals of two hours, four doses of oil of chenopodium were administered, each dose consisting of two capsules and each capsule containing 16 drops of the oil and " 0·2 menthol." Vomiting occurred immediately after the last dose, and was followed by somnolence, giddiness, sudden loss of hearing and sudden loss of sight. All the symptoms disappeared in the course of a few hours, except the loss of hearing. No worms appeared in the stools. Nineteen months afterwards the ear trouble still persisted.

A. A.

PARREIRAS (Decio). **O chenopodio e a sua toxidez.** [The Toxicity of Chenopodium.]—*Brazil Medico.* 1921. Dec. 17. Year 35. Vol. 2. No. 23. p. 352.

Refers to observations of LELLIS and DE ALMEIDA on the toxicity of chenopodium [see this *Bulletin*, Vol. 19, p. 252.]

After four years' experience in Campos, where an average of 2,500 cases per month, or a total of 100,000 cases, were treated with chenopodium alone, the writer would go further than LELLIS by affirming chenopodium to be a perfectly safe drug, productive of no more serious effects than occasional slight tingling of the palmar and plantar regions, transitory hypoacusia and slight oedema of the lower extremities.

In Rio Bonito the Rockefeller Foundation recorded two fatal accidents. According to Dr. Lewis HACKETT, of the same institution, death was caused in 14 persons of a total of 644,000, or an average of 1 in 46,000—a mortality rate much lower than in the case of chloroform (1 in 4,000), ether (1 in 16,000) or diphtheria antitoxin. In the writer's opinion there is no justification for the administration of the drug in quantities so small as to diminish its value as an anthelminthic.

He gives a table of dosage used in Campos :—

1–10 years	2 drops for each year of age.
10–12 „	25 drops.
12–15 „	30 „
15–20 „	40 „
20–50 „	50 „
50 years and upwards ..	40 „

A. G. B.

TATE (G.). **Physiological Standardisation of Digitalis with Special Reference to a Method Suitable for Use in India.**—*Indian Med. Gaz.* 1921. June. Vol. 56. No. 6. pp. 205–207.

From the extremes of heat and moisture occurring at different seasons and places in India considerable variations must be expected in the amount of glucosides present in Indian grown digitalis ; also owing to the heat the tincture deteriorates. The standardization of Indian tincture of digitalis appears not to be easy.

As ouabain (crystalline strophanthin) is fairly stable the author recommends the establishment of a standard by comparison with it : the minimum amount of ouabain per given weight of frog at a specified temperature producing the same effect—i.e., systolic arrest—as an approved standard digitalis tincture could be determined and used generally as a standard.

It would be an advantage if once a year during the cold weather a tincture made from the mixed Indian leaves stored in depots were compared clinically with a sample of standardized English digitalis in a case of auricular fibrillation.

A. A.

BOYD (Augusto S.) & JOSEPH (Morris). **Intrarectal Administration of Salvarsan.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1918. Jan.–June. Vol. 11. Pt. 1. pp. 77–82.

In view of the facts that in some patients the intravenous method of giving salvarsan is impossible without dissection of the vein, which is undesirable when injections have to be repeated, and that untoward effects are met with by all physicians, the authors, in Panama, tried administration by the rectum. The salvarsan or neosalvarsan is prepared just as in the intravenous method, and is made up with 50–100 cc. of fluid. The patient is put to bed and about 10 minutes allowed for the injection, which is preceded by a cleansing enema. 0·9 gm. neosalvarsan and 0·6 gm. old salvarsan may be thus given every three days for three to five times.

Six cases of syphilis so treated are quoted, and two of relapsing fever are mentioned ; in all the immediate results appear to have been excellent. No reaction was ever seen. They conclude that the intrarectal method is as successful as the intravenous in the treatment of relapsing fever and syphilis ; that untoward effects are eliminated by slow absorption ; that no special skill is required ; and that it is the method of choice in nervous or obese subjects, or in very anaemic women and children.

A. G. B.

de Castro (A. Bayley). **Iodine Injections for Septic Conditions.**—*Indian Med. Gaz.* 1921. Oct. Vol. 56. No. 10. p. 375.

The author, who is Jail Medical Officer, Port Blair, Andaman Islands, has employed intravenous iodine injections for septic conditions for about a year and has had "very novel and highly gratifying results," especially in ulcerative processes and phagedena. He starts with an injection of tincture of iodine, ♏5 in 1 cc. normal saline, and goes up to ♏20 in 10 cc., given every second day or, in bad cases, every day. In the author's words, an unhealthy looking surface freshens up and takes on a nice healthy look, sloughs are cast off, profuse discharges of pus stop, and healthy granulations start to shoot up all round. Fever and pain disappear. The white cell count rises to 15,000 or 20,000. In future he proposes to start at ♏ 20 of the tincture and work up to 80, which represents 2 gr. of iodine. In only two instances has there been a marked reaction. A detailed record of the cases treated is being made [see also this *Bulletin*, Vol. 18, pp. 281–2.]

A. G. B.

Ambrose (Lodilla). **Notes on Tropical Diseases.**—*New Orleans Med. & Surg. Jl.* 1922. May. Vol. 74. No. 11. pp. 717–721.

Arce (Julian). **Influencia de la última guerra sobre el estudio de la medicina tropical y sobre la ensenanza médica general.**—*An. Facul de Med. de Lima.* 1920. Vol. 6. pp. 101–108.

Bance (J. E.). **Toxicologie prélèvement des viscères pour l'analyse.**—*Arch. Inst. Pasteur. de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 253–258.

Bardou. **D'un traitement populaire des maladies d'estomac en Tunisie.**—*Arch. des maladies de l'appareil digestif et de la nutrition.* 1921. Oct. Vol. 11. No. 5. pp. 335–337.

Broden. **Les caractéristiques principales de la Pathologie Exotique.**—*Bruxelles-Médical.* 1921. Dec. 1. 2e année. No. 3. pp. 61–66.

Brumpt (E.). **Les médecins et les Colonies. Le problème Médico-Colonial: le recrutement.**—*Presse Méd.* 1922. June 7. Vol. 30. No. 45. pp. 937–939.

Camail (des T. C.). **Quelques considérations sur la pathologie de la population indigène de Madagascar.**—*Presse Méd.* 1922. Sept. 6. Vol. 30. No. 71. pp. 1486–1488. With 2 text figs.

Celestino dos Santos (Murillo). **Indice neutrophilo normal na Bahia.**—*Brazil Medico.* 1921. Nov. 12. Year 35. Vol. 2. No. 18. pp. 269–270.

Combey (J.). **La médecine française en Tunisie.**—*Presse Méd.* 1922. June 14. Vol. 30. No. 47. pp. 977–986 & 992. With 8 text figs.

Cunningham (J.). **India's Debt to Medical Research, being the Presidential Address delivered to the Medical Research Section, Indian Science Congress, 1922.**—*Indian Med. Gaz.* 1922. June. Vol. 57. No. 6. pp. 201–204.

Grabham (Michael C.). **Bradshaw Lecture on Subtropical Esculents. Delivered before the Royal College of Physicians of London.**—*Lancet.* 1921. Dec. 31. pp. 1357–1362.

Harries (D. J.). **Surgical Problems and Difficulties in the Tropics.**—*China Med. Jl.* 1922. Sept. Vol. 36. No. 5. pp. 385–391. With 3 charts. [See this *Bulletin*. Vol. 16. p. 225.]

Hehir (P.). **Epithelioma in Kashmir.** [Correspondence.]—*Lancet.* 1922. Feb. 4. p. 250.

den Heijer (J. K.). **Een geval van Angiosarkoma van de lever.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 372–380.

Lecercle. **Maroc et chirurgie.**—*Arch. Méd. et Pharm. Milit.* 1922. Mar. Vol. 76. No. 3. pp. 291–298.

Low (C. W.). **The Medical Aspect of Life Insurance in China.**—*Nat. Med. Jl. China.* 1922. June. Vol. 8. No. 2. pp. 94–100.

Polidori (V.). **Fonctionnement du laboratoire de Bactériologie clinique de l'hôpital indigène du Protectorat pendant l'année 1920.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1921. July. Vol. 12. No. 1. pp. 83–86.

HEAT STROKE.

i. RICHET fils (Charles). **Recherches expérimentales sur le coup de chaleur et l'insolation. Chimiothérapie ; hémoclasie a calore : accoutumance ou immunité.**—*Jl. de Physiol. et de Path. gén.* 1922. Vol. 20. No. 1. pp. 59–71.

ii. ——. **Contribution à l'étude et à la thérapeutique expérimentales du coup de chaleur.**—*C.R. Soc. Biol.* 1921. Oct. 22. Vol. 85. No. 29. pp. 713–714.

iii. ——. **Accoutumance expérimentale à l'insolation ou à la chaleur. Accoutumance ou immunité.**—*Ibid.* Nov. 26. No. 34. pp. 980–981.

i. The experiments were carried out during the extreme heat of July, 1921. The animals used were mice, rats and rabbits. They were placed in glass boxes exposed to the sun or in a dry stove. When extra heat was required for some rabbits they were attached to a metal plate heated below by steam. The upper surface on which they were placed was covered with cotton wool and care was taken not to burn them.

Heat stroke in mice has the following features : they did not suffer much in the stove at 37° C. ; but at 39° or 40° they became restless after about five minutes ; after 20 minutes convulsions and death occurred. Often there was coma after the convulsions. Increased respiration is evident in mice ; but the limit is difficult to estimate since at the ordinary temperature the mouse [? under the conditions of the experiment] respires 120 to 160 times each minute and with extreme heat it is impossible to count the respirations.

The lesions in the rat were those usually observed : blood partly or entirely coagulated in the vessels, death with heart in systole, pleural and pulmonary ecchymoses, and sometimes cerebral haemorrhages [*cf.* this *Bulletin*, DYKE (C. S.), Vol. 16, pp. 58–59 ; KOIZUMI, Vol. 16, p. 66]. A table gives a résumé of the author's experiments on mice :—

Age in Days.	Weight in Grammes.	Resistance in Minutes.	Resistance of Adults in Minutes.
3	1	8	36
			36
15	4	20	25
21	7	60	29
42	13	47	29
			40
35	12·5	45	27

A table is given with similar statistics for adult rats and mice exposed to the sun or in the stove. The most useful drug with the usual methods employed for combating heat-stroke was morphia. Oil of camphor and caffeine had some good effect.

The action of alcohol was indifferent and adrenalin and ether were without any therapeutic value. Kola, almost a specific for muscular fatigue in man, had no effect on animals suffering from sunstroke or the prolonged effect of heat. The destructive action of heat on the blood was examined in mice and rabbits :—

(*a*) Coagulation.—Mice were placed in a box for 20 minutes at 40° C. They were removed and killed at intervals as shown in the following " table " :—

Number of Mice.	Interval between Removal from Box and Experiment on Coagulation in Minutes.	Time of Coagulation in Minutes.
1	0	2
2	10	7′55″
3	23	3′45″
4	50	7′
5	70	15′(?)
Control 1	—	13′50″
„ 2	—	13′55″

Thus coagulation, accelerated at first, is retarded at a later interval.

(*b*) *Modification of appearance of the blood.*—Whereas in certain colloidoclasic states the venous blood is a brilliant red, in the animals under experiment the arterial—and still more the venous—blood was black.

(*c*) *Leucopenia.*—For these experiments rabbits were used.

——	Number of White Corpuscles.		
	Rabbit 1.	*Rabbit 2.*	*Rabbit 3.*
Previous to heating ..	7,600	7,600	8,400
3 min. after it began ..	—	4,700	—
12 „ „ „ ..	3,800	—	—
22–24 „ „ „ ..	3,000	—	4,900

The serum of a rabbit subjected to extreme heat injected into another rabbit causes a leucopenia more intense than does the serum of a normal rabbit, showing that the leucopenia observed in the heated animals is not a mechanical phenomenon as seen in vaso-dilatation, but is (at least in part) humoral.

(*d*) *Vaso-dilatation and hypotension.*—In heat-stroke or sunstroke vaso-dilatation and hypotension are classic and evident in man. This vaso-dilatation is also present in rats, mice and rabbits under experimental conditions.

As to the development of a tolerance of heat the results are recorded as follows: out of 13 experiments 10 showed that animals exposed a second time to extreme heat after a sufficient lapse of time (20 days) develop a resistance greater than that of controls, a resistance in certain experiments more than double.

ii. Rats and mice were exposed, in glass cases, to the direct effects of sunlight, or were placed in a stove under dry heat. Certain drugs —oil of camphor and caffeine—were found to prolong life; but only for short periods [this *Bulletin,* Vol. 9, pp. 173 and 174, BRAM, HANSON; Vols. 11, 13, 16, KOIZUMI].

iii. Records a number of experiments showing that mice can be gradually made to tolerate exposure to direct sun rays or to artificial heat. The blood of resistant animals was injected into mice and rats; but there was no proof of any immunity.

J. H. Tull Walsh.

ALEXANDER (R. H.). **Notes on Cases of Heatstroke occurring in British Troops Stationed at Basra, Mesopotamia.**—*Jl. Roy. Army Med. Corps.* 1922. May. Vol. 38. No. 5. pp. 358–366. With 2 charts in text.

The author was in charge of No. 3 British General Hospital, Basra, during the hot seasons of 1920 and 1921. The climatic and meteorological readings for these years do not differ much from those recorded in the careful investigation recorded in this *Bulletin,* Vol. 16, p. 53 [WILLCOX; HILL].

All the cases—20 in 1920 and 35 in 1921—were of the paralytic type, with high temperature (about 107° F. in rectum), coma, contracted pupils and stertorous breathing, and with cardiac depression leading in most of the fatal cases to oedema of the lungs. This cardiac weakness remained as a serious accompaniment of convalescence, and an unstable temperature, insomnia and loss of mental concentration and severe headaches persisted until the cooler weather set in.

Treatment.—Each case was covered with a sheet and iced water played on to him and his body rubbed with ice. Quinine bihydrochloride, 10–15 gr., was given intravenously as a routine. Camphor (2 gr.) was used as a heart stimulant and digitalin 1/100 gr. was frequently given with it. For wild delirium chloroform was the only efficacious treatment, and morphia (¼ gr.) was found to control further convulsions and delirium. Alcohol has a marked effect on prognosis. In 15 per cent. alcoholics and 18 per cent. total abstainers (accurate data of the rest could not be obtained) the mortality was 100 per cent. and nil respectively.

TABLE IV.

Maximum Temperature (rectal).	Number of Cases.	Number of Deaths.
110° + F.	14	6
109°–110° F.	12	5
108°–109° F.	14	5
107°–108° F.	12	2
Cases admitted dead where temperature had not been recorded ..	3	3

TABLE VI.—Results.

——	Recovered.	Died.
A.—Rapid recovery from acute symptoms .. Eleven of these cases were treated at bath stations and hyperpyrexia was reduced before admission to hospital.	27	—
B.—Remaining dangerously ill for over 24 hours .. In three cases a favourable prognosis could not be made for over a week.	7	—
C.—Rapidly fatal cases .. .. Of these 6 were admitted dead. „ 5 died within 1 hour. „ 2 „ „ 8 hours.	—	13
D.—Ending fatally after several days' illness .. 2 cases died on the 2nd day. 1 case „ „ 3rd „ 2 cases „ „ 4th „ 2 „ „ „ 5th „ 1 case „ „ 11th „	—	8*

* It was most disappointing losing these cases as, although they appeared hopeless, one always trusted that they might rally as did the cases under heading B.

J. H. T. W.

GIGLIOLI (G.). **Acclimatization and Sunstroke.**—*Jl. Trop. Med. & Hyg.* 1922. June 15. Vol. 25. No. 12. pp. 185–188.

A compiled review of the effects of heat on the diseases and possible acclimatization of Europeans in tropic lands.

[Heat stroke is not synonymous with tertian ague as suggested.]

J. H. T. W.

LEGER (Marcel). **Insolation mortelle chez le Chimpanzé et altérations morphologiques de son sang.**—*C.R. Soc. Biol.* 1922. July–Sept. Vol. 87. No. 28. pp. 874–876.

The author records the unfortunate destruction of three chimpanzees by sunstroke. The animals (*T. niger*), one adult and two young, were carelessly left in a yard of the Institute of Biology, Dakar, from 12 to 2 p.m. They were tied and could not move into any shade which the walls might have afforded. Their cries attracted attention, but too late, and the chimpanzees passed from convulsions to coma and death. Cold baths and cold compresses on the head produced no effect. Rectal temperature was 40° C. 15 minutes after death and still 38·9° C. after two hours. The autopsies showed no lesions except intense congestion of the organs, especially the lungs ; there was fluid effusion in the pericardium [*cf.* Pathology of Heat-Stroke, this *Bulletin,* Vol. 16, pp. 58–59 (DYKE)].

J. H. T. W.

FUNAIOLI (Giulio). **Il colpo di calore nei lattanti sani in Tripolitania.**—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1920. Feb. & Apr. Vol. 1. Nos. 2 & 4. pp. 76–82 ; 145–154.

The author believes that extreme heat and sunstroke produce in healthy infants vomiting, diarrhoea and marked dyspepsia with high temperature.

J. H. T. W.

BLACKWATER FEVER.

ESQUIER. **La fièvre bilieuse hémoglobinurique ; recherches étiologiques ; essais thérapeutiques.**—*Arch. Méd. et Pharm. Nav.* 1922. Jan.-Feb. Vol. 112. No. 1. pp. 5-46.

This paper is based on observations made on 23 cases of blackwater fever at Dakar, 20 being treated between August, 1918, and March, 1920, in the hospital of the Marigot ; all were young European sailors.

The author first deals with the question whether blackwater fever is a manifestation of malaria, whether it is paramalarial, or whether it is independent of malaria. He points out in all countries where blackwater occurs malaria is endemic, but that, on the contrary, blackwater is not always found in malarial districts, *e.g.*, it is unknown in Algeria and in Italy [*sic*] and has only recently been recorded from the Indies, Solomon Islands and New Hebrides. This raises the question whether the two diseases are not superimposable, the region infested by blackwater being less vast than that by malaria.

In only 37 per cent. of the cases examined were parasites found in the blood. *P. falciparum* was found in all, and sometimes *P. vivax* also and even *P. malariae*, so that it cannot be argued that blackwater is simply determined by the agent causing malignant tertian. fever. Undoubtedly, the great majority of cases of blackwater have had previous malaria, but a few cases are recorded in which there was no antecedent malaria, and one of the author's cases belonged to this category, but it is extremely difficult to be certain of this, as the absence of typical attacks of fever does not necessarily mean freedom from malarial infection. The author believes that there is really a malarial substratum in blackwater fever. It is not necessary, however, to be an old colonial to contract blackwater fever. The cases observed at Dakar have almost all been in men recently disembarked, *i.e.*, less than a year. The degree of malarial intoxication varies greatly. So far as one could judge, three of the cases suffered profoundly from malaria, 18 in a moderate degree, and two slightly. As the result of observing 2,500 cases of malaria, the author arrived at the conclusion that cachectic and profoundly anaemic individuals escape, whilst those who suffer only moderately are attacked with blackwater. In a table statistics are given of the total strength and of the number of cases of malaria and of blackwater fever during the years 1904-20, from which it is seen that the number of cases of malaria has inconstant relation to those of blackwater. The majority of cases of blackwater fever occurred after the rains during the cold season, viz., December to February.

Regarding the differential leucocyte count in blackwater fever, the author found that at the beginning of the disease the formula was almost normal and that then the polymorphonuclear leucocytes decreased and the lymphocytes increased, and finally the reverse occurred, until, after the attack, the formula again became normal ; the eosinophiles were scanty during the attack.

The next section is devoted to a summary of some of the theories that have been advanced to explain the haemolysis, but the author does not add anything new to this aspect of the problem. Regarding the part played by quinine, Esquier considers that there occur undoubted cases of quinine haemoglobinuria having no relation to blackwater, and that although it is possible that in certain cases of malaria quinine may determine a blood shock leading to blackwater, yet in the great majority of cases the condition is not precipitated by this drug.

The question of the existence of a specific infective agent capable of determining a haemoglobinuric paroxysm in a malarial subject is next considered, and the various previous observations along this line referred to—particularly the bodies in the large mononuclear cell described by LEISHMAN, and the spirochaetes found in the blood of a blackwater case by SCHÜFFNER. The author never succeeded in finding spirochaetes in the blood in his cases, but did find in the liver of one case microorganisms bearing a close resemblance to the icterohaemorrhagic spirochaetes, some of which were inside macrophages and had a length of 22–24 μ. It remains to determine the true nature and rôle of the organisms.

The last section deals with various attempts at therapy.

The conclusions are: Blackwater fever is conditioned by the existence in the patient of a malarial substratum. There are, however, between blackwater and malaria, beside clinical symptoms, profound differences (inconstant parasite findings, special leucocyte formulae, failure of the parallelism in the endemo-epidemic development of the two affections, etc.).

Quinine cannot be regarded as a necessary or sufficient cause of blackwater.

The haemolytic shock is determined in malarial subjects by an exogenous or endogenous cause which is still unknown, and is perhaps an infective agent associated with malaria.

In addition to purely symptomatic treatment, the following are of advantage:—

Injections of serum to which glucose or lactose is added.

Injections of horse serum.

Transfusion of blood in cases of extreme anaemia.

W. Yorke.

GIBLIN (W. E.). **Some Clinical Observations of Blackwater Fever in Papua, and their Bearing on its Aetiology.**—*Jl. Trop. Med. & Hyg.* 1922. July 1. Vol. 25. No. 13. pp. 212–214.

The conclusions are:—

"1. That malaria is an essential contributing cause in the production of the haemolytic factor.

"2. That the haemolytic factor has still to be demonstrated.

"3. That it is impossible to define blackwater fever with any definite precision as it is not a specific disease, but rather a symptom complex; in fact, a complication of malaria."

W. Y.

WIGGINS (C. A.). **Report on Blackwater Fever in Uganda for 1921.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1921.* pp. 54–58.

During 1921 there were 62 cases of blackwater fever with 15 deaths. Twelve of these cases occurred among Europeans, 49 among Asiatics, and 1 was a native case in a child aged 2½. In a table the cases are grouped according to the length of residence in the tropics. Previous malaria is reported with regard to 54 of the cases and nothing is known on this point in the other 8 cases. In 21, there was a history of previous attacks of blackwater fever. Jaundice is stated to have occurred in 35 of the cases, relapses of haemoglobinuria in 7 and suppression of urine in 7. The duration of the haemoglobinuria in various cases is given in a table.

W. Y.

SALVIOLI (Gaetano). **Beitrag zur Histopathologie der Niere bei Schwarzwasserfieber.** [On the Minute Pathology of the Kidneys in Blackwater Fever.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 1. pp. 6–17.

The author has examined microscopically the kidneys of 13 cases of blackwater fever dying at the Hamburg Tropical School. In addition to the ordinary method, Miller's method of elective staining of haemoglobin was used. According to this author, only formalin or chromic material is suitable and preferably that fixed in formalin or Orth's mixture and subsequently hardened in Müller's fluid.

The sections were stained at least 48 hours in Delafield's haematoxylin and then differentiated in dilute (1 in 1 of distilled water) Weigert's borax ferrocyanide of potassium solution. There resulted complete decolorization of albumin and blood corpuscles, so that only pure haemoglobin remained stained. The sections in chromic material were deep blue in colour, while those of formalin material were blackish. In Salvioli's experience, only moderately good results were obtained with formalin material stained by Miller's method, but better results were given by first treating the formalin, or otherwise fixed, material with Müller's fluid for two or three days ; in this way, the haemoglobin, after differentiation, stained dark blue violet.

In the kidneys of other diseases which simulate the histopathology of blackwater closely, the dark blue violet staining was not observed.

The best picture of the Berlin blue reaction was obtained in alcohol fixed material, and the quickest and most certain method was that of ZIEMANN, viz., treating the section with a warm solution of one per cent. HCl in glycerine after immersion for some minutes in ferrocyanide of potassium solution.

Details of the appearances found in the 13 cases are given.

The following facts were made out :—

1. In general, signs of nephritis were absent.
2. As a rule, the only changes present were those which resulted from blocks due to the mechanical action of the contents of uriniferous tubules.
3. The iron reaction is almost always positive in the convoluted tubules.
4. The use of the haemoglobin stain of Miller permits the conjecture that the excretion of haemoglobin takes place first in the convoluted tubules and in the loops of Henle.
5. Changes in the corpuscles, haemorrhages, malaria parasites and pigment were not observed.
6. By the investigation of the kidneys with Miller's method and the Berlin blue reaction, a differential diagnosis between blackwater and yellow fever can be made.

W. Y.

---

i. ESQUIER. **Note sur le traitement de la fièvre bilieuse hémoglobinurique.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Nov. Vol. 1. No. 4. pp. 3–6.

ii. ESQUIER & GODILLON. **De la transfusion du sang citraté dans la fièvre bilieuse hémoglobinurique.**—*Ibid.* 1920. Apr. Vol. 2. No. 4. pp. 90–93.

i. Between November, 1918, and August, 1919, the author saw 15 cases of blackwater fever amongst young marines, none of whom had lived more than a year at Dakar ; of these, two cases ended fatally.

The average number of marines at the port during the period was 450; the very high proportion affected with blackwater is to be explained by the enormous amount of malaria amongst ships' crews at the harbour. As the result of observations on the treatment of these cases, the author believes that benefit accrues from subcutaneous injections of distilled water and especially from subcutaneous injections of about 20 cc. of horse serum.

ii. Details are given of three cases of blackwater fever observed by the authors. The first died and the other two recovered owing, the authors believe, to transfusion of citrated blood—400 gm. in one case and 300 gm. in the other.

W. Y.

LEJEUNE (E.). **Transfusion sanguine après hémoglobinurie grave.** —*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 299–300.

As a last resort, a patient (European, aged 34) who after an attack of blackwater fever was in a desperate condition was transfused with human blood. At the time of the injection the patient was gravely ill, very feeble, delirious, and the pulse, notwithstanding stimulants, hardly perceptible; the red cell count was only 950,000. Blood (500 cc.) was withdrawn from a healthy European into a bowl containing 50 cc. of 3 per cent. citrated saline solution and was then slowly injected into the median basilic vein of the patient by means of a salvarsan apparatus. No ill effect followed the operation and almost immediately a great improvement in the patient's condition resulted.

W. Y.

i. KERNEIS & MORIN. **Un cas d'anémie profonde suite de fièvre bilieuse hémoglobinurique guérie par une transfusion sanguine.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. Mar. Vol. 3. No. 13. pp. 32–34.

ii. —— & ——. **Un cas de fièvre bilieuse hémoglobinurique survenue chez un paludéen au cours d'un traitement par le cyanure de mercure.**—*Ibid.* p. 31.

iii. CRICHLOW (Nathaniel). **The Treatment of Blackwater Fever.**—*Jl. Trop. Med. & Hyg.* 1921. Dec. 15. Vol. 24. No. 24. pp. 318–321. With 2 charts in text.

i. Details are given of a case of blackwater which, when in a very critical condition, was treated by transfusion of 200 gm. of citrated blood obtained from his brother; recovery resulted.

ii. The patient who had lived for 12 years in the Colonies was given, as treatment for syphilis, an intravenous injection of 0·01 gm. cyanide of mercury on each of three successive days: the following day he suddenly developed blackwater fever. Two days later the symptoms subsided and recovery resulted.

iii. The author describes a method of treatment adopted by him in a number of cases of blackwater fever, but does not produce any evidence that his procedure is of any special value.

W. Y.

ROY (Suresh Clandra). **Blackwater Fever as it occurs in the Duars and its Treatment.**—*Indian Med. Gaz.* 1922. Mar. Vol. 57. No. 3. pp. 83–85.

PELLAGRA.

KHALIL (M.). [Translated from the Original by.] **The Earliest Account of Pellagra in Egypt from the Writings of an Egyptian Physician, A.D. 1846.**—*Proc. Roy. Soc. Med.* 1922. Aug. (Sect. of Trop. Dis. & Parasit.) Vol. 15. No. 10. pp. 45–47.

Ahmed Ibn Hassan EL-RASHIDY published a volume in 1846 dealing with diseases of the skin. In this book there is a description of pellagra and, according to the author of the paper under review, this is the first account of the disease in Egypt. Extracts from the work are given and there can be no doubt that the author knew just as much, or as little, about pellagra as we do now. As etiological factors maize, insanitary houses and starvation are mentioned, and for treatment good food is the outstanding remedy.

A. D. Bigland.

WHEELER (G. A.). **Treatment and Prevention of Pellagra by a Daily Supplemental Meal.**—*Jl. Amer. Med. Assoc.* 1922. Apr. 1. Vol. 78. No. 13. pp. 955–957.

This paper is a record of the work done at a Pellagra Outpatient Clinic which was established in connexion with the Pellagra Hospital at Spartanburg, S.C., in November, 1914. The only treatment administered was a daily supplemental meal consisting of fresh meat, milk, vegetables, fruit, bread and butter. Apart from the meal the patients "were allowed to follow their individual inclinations and habits, dietetically and otherwise."

From November 1, 1914, to July 1, 1920, 105 cases were under treatment. Of these 24 were excluded because of the short period of treatment and a further 27 patients are not included because they presented no rash, though they were, none the less, undoubted pellagrins. Of the 54 remaining patients 14 were males and 40 females, while all except 2 were whites. "Of a total of 48 anniversaries passed by this group of patients from the time of their first attacks to the date of admission to treatment, there had been 416 (9·4 per cent.) regular, consecutive, annual recurrences, while for a total of 25 anniversaries passed under treatment there was not a single recurrence."

The author shows that such a daily supplementary diet as described is sufficient to prevent recurrences of pellagra. It would appear also that for return of symptoms "a deprivation period of less than five months is indicated."

A. D. B.

DEVOTO (Luigi). **La pellagra in Lombardia e nella Venezia Tridentina dal 1910 in poi.** [Pellagra in Lombardy and Venezia Tridentina since 1910.]—*Riv. Pellagrolog. Ital.* 1922. Jan.-Apr. Vol. 22. No. 1-2. pp. 4–6.

Pellagrin peasants, after living for some years beyond the Brenner without exhibiting any signs of pellagra, on return to their native country again showed symptoms of the disease after the use of sound maize. As a result of the investigations of BEZZOLA the campaign against pellagra was not limited to abolishing damaged maize but extended to sound also as an article of diet in Venezia Tridentina. Pellagra rapidly disappeared. In 1899 there were in Lombardy some 20,000 pellagrins and in Trentino 10,000. In 1920 not a single fresh case was recorded in the latter.

The original statement of LOMBROSO should, therefore, be modified. In practice " the use of sound maize may light up the disease in an ex-pellagrin (*i.e.*, one who previously has shown symptoms but has been free from them for some time) or aggravate the condition if actually present." In theory " the prolonged and intensive use of sound maize can give rise to pellagra."

During the war monotony of diet led in these districts to symptoms such as scurvy, oedema and haemorrhages, but not to pellagra, according to SICCARDI.

H. Harold Scott.

DE PROBIZER (Guido). **Studio sulla pellagra nelle popolazioni evacuate dal Trentino.**—*Riv. Pellagrolog. Ital.* 1921. Jan.–Apr., May–Aug., & Sept.–Dec. Vol. 21. Nos. 1–2, 3–4, & 5–6. pp. 7–12; 11–14; & 9–21.

When Italy declared war in 1915 the district of Rovereto, being in the war zone, was evacuated in all haste by military orders. A part of this civil population coming from the commune of Trambilleno was directed to the district of Salisburg accompanied by the writer, under whose care and observation they remained during four years exile. He set himself to investigate what would be the effect of this change of habitat upon the exiled community which in its own home had been severely proved by the endemic of pellagra, as the following figures show:—

1896–1901 Period.	average incidence of pellagra	56 cases
1904	incidence of pellagra	703 ,,
1907	,, ,, ,, ...	186 ,,
1913	,, ,, ,, ...	83 ,,

The population of the commune of Trambilleno in the year 1910 was 1,558. It is clear that the bad conditions were rapidly improving in the year before the war but the above table could not lead to the supposition that from the year 1914 pellagra in this community would be practically unknown. Yet such was found to be the case throughout the war period. The writer compares the conditions of life in Trambilleno with those in Salisburg. On removal to Salisburg there was a change from a predominantly maize diet to a mixed diet containing at first only a proportion of maize of the best quality and later consisting of milk, bread, potatoes, macaroni, beans, etc.

J. Rosslyn Earp.

RAMOINO (Paolo). **Contributo alla conoscenza delle cause del Maidismo sperimentale.** [Contribution to our Knowledge of the Causes of Experimental Zeism.]—*Ann. d' Igiene.* 1922. Mar. Vol. 32. No. 3. pp. 201–207.

The experiments here recorded were instigated by those of BAGLIONI and his conclusions that maize is deficient in the alkaline salts which are present in green food. For these experiments the author employed four young guinea-pigs and four adults and gave them a maize diet which he " corrected " by the addition of cellulose, sodium chloride, calcium phosphate and water, The diet in fact was maize flour 100 gm., sawdust 30 gm. (" segatura di legno " for which was substituted in part " piallatura del legno "—fragments of wood shavings), sodium chloride 3 gm., calcium phosphate 4 gm., water 250 gm.

For two or three weeks before starting on this diet they were given bread and green food. The food was well taken in the early days of the experiment, but not later. The animals all, except one, progressively lost weight and lived for periods varying between 8 and 37 days. At the autopsies the intestinal mucosa was inflamed, the abdominal organs congested, especially the liver and kidneys, the stomach and intestines were stuffed with whitish pultaceous material.

The author concludes that the dietetic correction does not maintain life and that the symptoms produced do not greatly differ from those seen with a diet of maize alone.

H. Harold Scott.

LUSTBERG (Sam R.) & BIRCHETT (J. A. K.). **The Breast Fed Pellagrin: Relation to the Avitaminoses.**—*Arch. of Pediatrics.* 1922. Apr. Vol. 39. No. 4. pp. 255–258.

Do breast-fed babies whose mothers are pellagrins become pellagrous themselves because of infection or because there is something lacking in their diet, *i.e.*, in their mother's milk?

The authors reject the infection theory and support the deficiency view because these babies recover when a wet nurse is substituted for the mother and more quickly still if cow's milk and fruit juice are given in addition.

The milk of the mother in these cases contains the proper proportions of fat, carbohydrate and protein.

A. D. B.

STRONG (Robert A.). **An Interesting Case of Pellagra in a Young Child.**—*Southern Med. Jl.* 1922. July. Vol. 15. No. 7. pp. 550–551. With 2 text figs.

A typical case of pellagra in a young child is described. The opportunity was taken of injecting 3 cc. of the spinal fluid into the "frontal convolutions" of two Rhesus monkeys. The results were negative even after the monkeys had been under observation for eight months.

A. D. B.

WHEELER (G. A.) & GOLDBERGER (Joseph). **On the Probable Identity of the Chittenden-Underhill Pellagra-like Syndrome in Dogs and "Black-Tongue." With Report of Necropsy Findings in Two Cases of Black-Tongue.**—*Public Health Rep.* 1922. May 5. Vol. 37. No. 18. pp. 1063–1069.

In August, 1917, CHITTENDEN and UNDERHILL described a pellagra-like condition occurring in dogs fed upon a diet containing boiled peas, cracker meal and cottonseed oil.

The condition is as follows:—After a sudden onset of apathy and loss of appetite the dog presents curious buccal appearances, viz., masses of pustules upon the inner surfaces of the cheeks and lips and the edges of the tongue; the mucous membrane of the mouth comes away in shreds when stroked with cotton; intense salivation with foul smell; the teeth remain solid and normal. Blood-stained motions are passed and death results. Some of the animals die rapidly in convulsions.

Those dying with the mouth condition and bloody diarrhoea present an intense haemorrhagic appearance of the lower bowel, while those presenting convulsions only show one or two large ulcers in the duodenum.

The condition known as "black tongue" was first described in 1852 and was called "typhoid of dogs." SPENCER (1916) and CARY (1920) pointed out that this disease was really pellagra in dogs. The authors point out that "black tongue" has the same geographical distribution in the U.S.A. as has pellagra, that it occurs almost exclusively in the south and presents itself usually in the summer and autumn. It may occur more than once in the same animal. It appears certain that the condition described by CHITTENDEN and UNDERHILL is identical with "black tongue." A very full bibliography is given.

A. D. B.

i. GOLDBERGER (Joseph). **The Relation of Diet to Pellagra.**—*Jl. Amer. Med. Assoc.* 1922. June 3. Vol. 78. No. 22. pp. 1676–1680.
ii. MACNEAL (Ward J.). **Pellagra—Lantern Slide Demonstration.**—*Long Island Med. Jl.* 1922. June. Vol. 16. No. 6. pp. 225–227.
iii. PARRISH (C. C.). **Ueber Pellagraausbreitung vom Standpunkte des nordamerikanischen praktischen Arztes.**—*Dermat. Woch.* 1922. Aug. 19. Vol. 75. No. 33. pp. 817–821.

i. This is a review of recent work on pellagra given in the form of a lecture. No original work is described. The author concludes that "Diet controls the course and development of the disease" and that "the relationship thus disclosed probably depends primarily on a specific quality of the amino-acid make up of the protein supply."

ii. No new work is described.

iii. There is nothing new in this paper except the statement that pellagra can be checked by the administration of thymol and chenopodium oil. For this and other reasons the author is of the opinion that the disease is an infection.

A. D. B.

AVITAMINOSES.

OSBORNE (Thomas B.) & MENDEL (Lafayette B.). **Further Observations on the Distribution of Vitamin B in some Vegetable Foods.** —*Jl. Amer. Med. Assoc.* 1922. Apr. 15. Vol. 78. No. 15. pp. 1121–1122. With 1 fig.

Young white rats were used in feeding experiments carried out with the object of testing the vitamin B content of certain foods hitherto uninvestigated in this respect. Asparagus was found to be exceptionally rich in this substance, while celery, dandelion, lettuce and parsley contain "noteworthy amounts."

Asparagus, celery and lettuce when compared with apples, peas and grape juice were found to have a higher vitamin B potency "in terms of the edible product consumed."

A. D. B.

DAMON (Samuel R.). **Observations on the Distribution of Vitamin B.** —*Jl. Amer. Med. Assoc.* 1922. July 8. Vol. 79. No. 2. pp. 128–129. With 2 charts.

The use of beef extract in convalescence is almost universal. It is important, therefore, to ascertain whether vitamin B is present in such extracts, because of the effect which this vitamin has upon appetite and food intake.

Feeding experiments were carried out on young rats with this end in view. The author finds that " commercial beef extract and peptone are devoid of the water-soluble vitamin B."

A. D. B.

GHOSE (Sadhindra Nath). **The Examination of Some Indian Foodstuffs for their Vitamine Content.**—*Biochem. Jl.* 1922. Vol. 16. No. 1. pp. 35–41.

Samples of pure Indian " ghee " were found to be as good sources of vitamin A as pure butter. Remelted ghee and adulterated ghee were not satisfactory in this respect.

Coconut oil and pure mustard seed oil gave growth in rats when given in large amounts (10–20 per cent. of the basal diet). Various lentils showed good quantities of vitamin B. Pure Indian flour was deficient in vitamin B, but the cruder varieties appeared to be more satisfactory.

A. D. B.

ROLLAND (O.) & JOUVE (A.) **Les éléments vitaminiques peuvent-ils être stabilisés et conservés ?**—*Gaz. des Hôpit.* 1922. Apr. 29. Vol. 95. No. 33. p. 534.

Vitamins do not keep well because of the action of certain oxidases. Acids, even in weak dilution, have the power of inhibiting this action. The authors used their vitamin extract Biotose (*Gaz. des Hôpit.*, Jan. 21, 1922, No. 6) and compared the results of a fresh preparation with those of one 11 months old having an acidity of 0·21 per cent. citric acid. Starved pigeons and guinea-pigs recovered rapidly when fed with the recent and the old extract. It seems, therefore, that small quantities of acid have a preservative power over vitamin preparations.

A. D. B.

i. SEIDELL (Atherton). **Improved Method for the Preparation of Vitamine-Activated Fuller's Earth.**—*Public Health Rep.* 1922. Apr. 7. Vol. 37. No. 14. pp. 801–803.

ii. ——. **A Physiological Test for the Activity of Vitamine Preparations.**—*Ibid.* June 23. No. 25. pp. 1519–1523.

i. The author describes a new method for the preparation of vitamin-activated fuller's earth. The procedure depends upon the work of OSBORNE and WAKEMAN, who found that when " fresh yeast is added to boiling water, acidified with 0·01 per cent. acetic acid, the yeast cells are disrupted, the protein is coagulated, and the vitamin set free to enter the aqueous solution." For full particulars of the method the original note should be consulted. The results claimed are that a much better preparation is obtained and that the technique is a great improvement as regards time and trouble.

ii. Pigeons are fed upon polished rice, but they are given also on alternate days " activated solid " (*i.e.*, vitamin-activated fuller's earth) in doses just sufficient to prevent loss of weight. The birds are in this way brought into a state of, what may be termed, vitamin equilibrium. If now the " activated solid " be replaced by the vitamin sample under observation there will be a sudden change if the substance tested is deficient in vitamin. Within ten days or so the pigeons are ready for another test and the procedures can be carried on in this way for many months. The method is described in considerable detail and in conclusion the author discusses the value of nitrogen estimation of vitamin extracts.

A. D. B.

ZILVA (Sylvester Solomon). **Conditions of Inactivation of the Accessory Food Factors.**—*Biochem. Jl.* 1922. Vol. 16. No. 1. pp. 42–48.

This paper is summarized as follows :—

" 1. The fat-soluble factor was destroyed in cod-liver oil by exposing it to ozone in the dark at ordinary temperature and by bubbling air through it at 120°.

" 2. The exposure of autolysed yeast juice to ozone in the dark did not destroy the activity of its water-soluble factor to any appreciable extent.

" 3. The exposure of decitrated lemon juice to ozone destroyed its anti-scorbutic activity. This was also destroyed by passing air through the solution at ordinary temperature.

" 4. Ultra-violet rays had no deleterious action on the accessory food factors in the absence of air.

" 5. Two hours' boiling did not destroy the anti-scorbutic potency of desiccated lemon juice in an atmosphere of carbon dioxide, whereas one hour's boiling in the presence of air destroyed its potency almost entirely.

" 6. Hydrolysis of decitrated lemon juice with hydrochloric acid for five hours impaired the anti-scorbutic activity of the juice. The juice, however, retained its activity to a very considerable extent."

A. D. B.

SCHEUNERT (Arthur) & SCHIEBLICH (Martin). **Studien ueber die Magendarmflora polyneuritischer Tauben und die Bildung antineuritischen Vitamins durch Darmbakterien.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. June 12. Vol. 88. No. 4. pp. 290–298.

It would appear from this paper that certain intestinal organisms grown upon vitamin-free media and administered to pigeons fed upon polished rice prevent or retard the development of typical neuritis.

A. D. B.

WEILL (E.), ARLOING (F.) & DUFOURT (A.). **Essai de traitement de la carence du pigeon par des cultures mortes ou vivantes de microbes intestinaux.**—*C.R. Soc. Biol.* 1922. June 10. Vol. 87. No. 21. pp. 50–52.

The attempt was made to arrest the " marche progressive " of starvation in pigeons fed upon decorticated rice by means of injection of certain intestinal bacteria. Both living and dead cultures were used for the purpose, but the wished-for results were not obtained.

A. D. B.

MOURIQUAND (G.) & MICHEL (P.). **Sur l'auto immunisation contre les régimes carencés.**—*C.R. Acad. Sci.* 1922. June 19. Vol. 174. No. 25. pp. 1639–1642.

It has been remarked that pigeons fed upon decorticated grains may show a regression of nerve symptoms after a period of paralysis has become established even though no alteration in diet has been made. Successive relapses and recoveries may occur also without diet changes. It would appear that the animal immunizes itself, as it were, against the starvation diet. The author has noted the same phenomenon in experimental scurvy. It appears that thyroid extract and certain fatty bodies prevent this immunizing process and hasten the development of scurvy. The phenomenon is not noted in acute scurvy (HOLST & FROLICH), but only the chronic form.

A. D. B.

HESS (Julius H.), MOORE (Josiah J.) & CALVIN (Joseph K.). **Experimental Studies with Proprietary Vitamin Products.**—*Jl. Amer. Med. Assoc.* 1922. May 13. Vol. 78. No. 19. pp. 1441–1445. With 7 charts in text.

Three proprietary vitamin products were studied, viz., Metagen, Vitamon and a substance containing dried orange juice and desiccated pig's liver. Experiments were made also with " Yeast-Vitamin-Harris " tablets.

The first three products were found to contain insufficient antiscorbutic vitamin to protect guinea-pigs from scurvy when given in the quantities recommended as protective in the case of infants. All the products contained water-soluble B vitamin, but were much less potent than fresh yeast, with the possible exception of the Yeast-Vitamin-Harris product.

The authors conclude with the remark: " Vitamins should be obtained from the dairy, the grocery and the market, not from the drug store."

A. D. B.

McCOLLUM (E. V.) & SIMMONDS (Nina). **The Potency of Commercial Vitamin Preparations.**—*Jl. Amer. Med. Assoc.* 1922. June 24. Vol. 78. No. 25. pp. 1953–1957. With 9 charts in text.

The authors have examined certain commercial products advertised as containing vitamins. Vitamin B was the particular one for the presence of which tests were made, because this is the most stable vitamin and therefore the one most likely to be present.

The preparations tested were :—Mastin's Yeast Vitamon Tablets, Yeast-Vitamine (Harris), Double Strength Yeast and Iron Concentrate, Irving's Phos-Pho Vitamine, Alpha Vitamine Tablets, Super-Vitamin Tablets, and none of them was found to contain a satisfactory amount of Vitamin B.

[See HESS, MOORE & CALVIN above.]

A. D. B.

SHORTEN (J. A.). **The Role of Vitamins in Tropical Diseases.**—*Indian Med. Gaz.* 1922. May. Vol. 57. No. 5. pp. 164–169.

Merely a lecture based upon known facts.

A. D B.

REVIEWS AND NOTICES.

WU LIEN TEH. [Edited by.] **Reports 1918-1922. North Manchurian Plague Prevention Service.**—354 pp. With 1 coloured plate, 36 figs., 1 map & 2 charts. 1922. Tientsin: Tientsin Press, Limited. [Price not stated.]

The greater part of this volume consists of an ably-written and detailed report on the plague epidemic in Northern Manchuria and Eastern Siberia during the winter of 1920–21. Since the great epidemic of pneumonic plague in 1910–11, Manchuria had been free from the disease; though sporadic cases, mostly of the bubonic form, were reported almost every year from some part of Siberia or Mongolia.

In October, 1920, cases of bubonic plague occurred at Hailar in the western part of North Manchuria, and close to the boundaries of Transbaikalia and Mongolia. The epidemic soon spread to the neighbouring towns, and the nature of the disease quickly passed through the septicaemic to the pneumonic form. By the end of January the disease had established itself in the town of Harbin, where about 1,300 people died. At Vladivostok, where the epidemic began in April and continued until August, about 500 deaths occurred. To the efficiency of the Plague Prevention Service may be attributed the fact that this epidemic was a much smaller one than that of 1910–11. In the latter nearly 60,000 persons died in Manchuria and North China; in the epidemic considered in this report about 9,000 fatal cases occurred.

The connexion of the tarabagan, or marmot (*Arctomys bobac*) with the disease is considered at some length; the evidence incriminating this animal is not at all strong. Some of the earlier cases of bubonic plague at Hailar were among coolies employed in a skinning factory, and this town and Manchouli (where there were about 1,000 deaths) are the two centres to which the Russian and Buriat trappers bring their skins. But no more direct evidence than this seems to be available. There is no doubt that sporadic cases of natural plague do occur among the marmots (although very few indeed have been observed), but no epizootic at all comparable to that which occurs among rats, has been seen among them. The Staff of the Plague Prevention Service found experimentally that the tarabagan may suffer from an acute form of plague, a chronic localized form, a pneumonic form, and an intestinal form. The tarabagan can be infected experimentally by feeding it on plague material; but this cannot be of any importance in nature, as the animal is purely herbivorous.

The report contains very interesting sections on the clinical observations made at the various hospitals and on the pathological findings in a series of 34 post-mortem examinations, 24 of which were of cases of the pure pneumonic form. In spite of their urgent duties connected with the control of the epidemic, the medical staff managed to carry out a number of scientific observations and much laboratory work. Two observations on healthy "carriers" among the "contacts" of pneumonic plague cases are important. These persons had plague bacilli in their sputum, as virulent as usual for guinea-pigs, up to five days after the last contact with a patient, although they never showed any clinical signs of infection. Further interesting experimental work was done on the vitality of the plague bacillus in sputum when exposed to direct sunlight, to diffused light and to low temperatures; also on the effect of various disinfectants.

Lack of space forbids more than a mere reference to the graphic description which is given of the dark and dirty, half-underground, over-heated and unventilated barracks in which the mining coolies live at Dalainor; to the ignorance and lawlessness of many of the people, who often violently opposed any antiplague measures; and to the difficulties of dealing with "contacts" where no hygienic accommodation was available and where the atmospheric temperature was as low as —25° C. That so much good work was accomplished in these difficult circumstances is a splendid testimony to the tactful resource and devotion of the members of the Plague Prevention Service. The report contains many photographs, illustrating different aspects of the epidemic. There is a sketch map of the plague region at the end of the book; unfortunately, the scale of the map is not given.

H. J. Walton.

MITCHELL (J. M.), ASHESHOV (I. N.) & RICHARDSON (G. P. N.). **Typhus Fever with Special Reference to the Russian Epidemics.**—48 pp. With 2 text figs. 1922. London: Baillière, Tindall, & Cox, 8, Henrietta Street, Covent Garden. [Price 3*s.* 6*d.* net.]

This small book contains an account of the experiences as regards Typhus Fever of the British Military Mission serving with General Denikin's Army.

The chaotic condition of a country during and following the retreat of a defeated force is vividly painted.

The clinical course of the disease is clearly described and complications and sequelae are detailed.

In the chapter on general treatment, the precautions necessary to secure adequate delousing of patients before admission to the hospital ward are duly emphasized, and the importance of good nursing and its effect upon the progress of the cases is awarded a justly prominent place.

In the chapter on Special Treatment non-specific serum therapy is very highly recommended. One, however, misses any reference to the work of DANIÉLOPOLU, but it is probable that an account of his methods did not reach Russia in time for their trial. The figures recorded by him in his book "Le Typhus exanthématique," published in 1919, of results obtained by intravenous injection of a solution of chlorine in hypertonic saline (see Review, this *Bulletin*, Vol. 18, p. 305) are remarkable, and this method of treatment seems to be well worthy of further trial.

The chapter on "Preventive Inoculation against Typhus Fever" is by Dr. I. N. Asheshov, and gives details of the method for the preparation of a "vaccine," *i.e.*, material containing killed virus. This consists of blood of a typhus patient, taken under aseptic precautions between the fourth and eighth days of the disease. After defibrination the blood is transferred to sterilized ampoules of 5 or 10 cc. capacity, and subsequently inactivitated at from 56° to 58° C. for one hour. A complete course of prophylactic inoculation consists of three injections, first 1 cc., second 2 cc. and third 2 to 5 cc. of defibrinated and inactivated blood at intervals of 4 to 5 days. No serious general reaction in 600 cases thus inoculated was observed.

The results were promising and are detailed in the *Lancet* for April 9, 1921, p. 742. Up to the present, however, this method of protection has had but a limited trial.

G. E. F. Stammers.

RIVERS (W. H. R.), M.D., F.R.S. [Edited by.] With a Preface by Sir Everard Im THURN, K.C.M.G., K.B.E., C.B.—**Essays on the Depopulation of Melanesia.**—pp. xviii + 116. 1922. Cambridge University Press. [Price 6*s.* net.]

Most of the contributors to this extremely interesting little volume on the depopulation—to the imminence of extinction—of Melanesia are agreed in recognizing another deplorable illustration of the effects of the introduction, by Europeans, into virgin soil, of diseases and poisons—chiefly infectious diseases—and of customs conducive to their spread. Among the diseases "pulmonary complaints" have an ominous significance, and among the accelerative customs the adoption of European clothing.

which is never taken off, even when, as often, it is wet through. In the case of Melanesia " recruiting " of labour—which also has ominous suggestions—has been, in the past more than recently, a contributory factor.

Two writers, Dr. Rivers and Dr. Speiser, while admitting all this immediate causation, go deeper for underlying and inciting causes. Dr. Rivers' argument is that owing mainly to the suppression of head-hunting, which as a religion was their bread of life, the Melanesians have lost all interest in living · in apathetic torpor they succumb to every new infection ; nor care they to " bring children into the world only to work for the white man." Dr. Speiser sees Carlyle's Niagara in the disruption of all tribal ties and restraints consequent on decline of the authority of the chiefs and contempt for the ancestral shrines—all this being indirect effect of intercourse with the European " superman."

However, there is a bright lining to the cloud, if only it be appreciated in time. Islands where Christianity has been introduced without disparagement of the authority of the native chiefs, and without unnecessary disturbance of native customs and habits, and has been really taken to heart by the people—such islands have survived and are recovering from the impact of European civilization.

Messrs. Rivers and Speiser in this vindication of religion and discipline have, like Orlando, wrestled well and overthrown more than the enemies of the Melanesian population.

A. Alcock.

Wellcome Bureau of Scientific Research. **Guide to the Wellcome Museum of Tropical Medicine and Hygiene.**—14 pp. With 4 illustrations. Wellcome Bureau of Scientific Research, 25, 26 & 27, Endsleigh Gardens, London, N.W.1.

By means of photographs, drawings, diagrams, and models, conveniently aided here and there by significant specimens, the divers particulars of the science and art of tropical hygiene and tropical medicine are, with infinite skill and pains, generously set forth in due order, course, proportion, and relation in this unique museum.

There is a section of hygiene ; a section of tropical diseases that are inoculated by the agency of arthropods that bite ; another section of tropical diseases in which infection comes mainly by the intestinal tract ; another section in which infection follows mainly from contact ; and a section including food-deficiency diseases, pathological miscellanea and infecta, and an index of medical zoology.

To take the item " malaria " as an illustration. In the tropical diseases section we see the whole chain of ideas evoked by the idea of malaria—parasite, mosquito, condition of sick man, mosquito haunts and breeding places, drainage, reclamation, mosquito nets, quinine, cinchona cultivation, etc.—all graphically developed ; and in the hygiene section we see the graphical representation of another line of related experiences—drains, levelling, training, oiling, natural enemies, propaganda, etc.

Certainly no educated man who intends to reside in the tropics should miss seeing this wonderful museum ; nor will any medical man, however expert, fail to get inspiration from it.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 2.

MEDICAL HELMINTHOLOGY: A REVIEW.—PART II.*

By R. T. LEIPER, M.D., D.SC.,
Sectional Editor, Tropical Diseases Bureau.

PLATYHELMIA—CESTODA.

Taenia.

Taenia solium is apparently now an uncommon parasite. The early statistics of its incidence are misleading, as they include *T. saginata*, which remained unrecognized as a distinct and valid species until the middle of the nineteenth century. BETTENCOURT (1913) studied its occurrence in Portugal, where it is much commoner than in any other country; and he found that 63 per cent. of the Taenias received by him from colleagues in Lisbon and the provinces were of this species.

Taenia saginata was found by DUPONT (1917) to be the cause of a reflex laryngeal spasm lasting some days and giving rise to almost fatal asphyxia. CHRISTOPHERSON and IZZEDIN (1918) record, as a case of great rarity, acute obstruction, necessitating laparotomy, due to a *Taenia saginata*. The absence of acute pain and the slight amount of collapse, associated with symptoms of acute obstruction, are regarded as characteristic of obstruction due to intestinal parasites.

Cysticercus cellulosae.

A case of general infection by *Cysticercus cellulosae* was reported by ABBOTT (1921) in the *Lancet*. The patient suffered from melancholia with a history of headache, dimness of vision, transient weakness of the left side and occasional fits. There were numerous small shotty subcutaneous nodules on the arms. After death, due to tuberculosis, the heart and the whole of the convex surface of the brain were found studded with cysts. They were numerous also in the subcutaneous tissues of the thorax and abdomen, and in the peritoneum. None occurred in the lungs, liver apex or kidney. In another case, recorded by HUGHES (1921), several cutaneous cysts, varying in size from that of a pea to a cherry, were distributed along the line of cutaneous nerves and had given rise to a provisional diagnosis of multiple neurofibromata.

---

* For Part I, see Vol. 19, p. 361.

VASILIN (1921) had a case in which the cysticerci were limited exclusively to the meninges. A medullary tumour, between the seventh cervical and the second dorsal nerves was diagnosed, but none could be found at operation. Autopsy showed severe fibrous inflammation of the pia mater, the thickening causing pressure on the roots of the cervical nerves. The larger vessels contained thrombi and cysticerci, which were the direct cause of endarteritis. No adult tapeworms were found in the intestines.

Infection of the central nervous system has also been studied by WATERHOUSE (1913). Clinical histories of two cases, which are given in detail, show that the epileptiform convulsions differ from true epilepsy in the more gradual onset of the fits. Von HERRENSCHWAND (1916) records two cases of subretinal cysticercosis in soldiers, both of whom it is said also harboured *Taenia saginata*. A. PILLAT (1920) reports a subretinal case from Poland, which is said to have followed after eating raw ham. No adult tapeworm was found. De SCHWEINITZ and WIENER (1919) describe the ocular examination of a case of cysticercosis of the vitreous at which distinct peristaltic movements of the cyst were visible, and the movements of the protruded head, neck and body were often very active. Ocular cysticercosis is a very rare condition ; from 1853 to 1866 V. GRAEFE (1866) saw only 90 cases out of 80,000 patients with eye diseases.

Cysticercus bovis.

FONTAN (1919) describes an apparently genuine case of *Cysticercus bovis* from the mammary region. Attention should be called to the economic importance of a paper by RANSOM (1914) on the destruction of vitality of *Cysticercus bovis* in beef. After six days' exposure to a temperature ranging from 11° to 15° F., the cysts in a heavily infected carcase gave no evidence of life, either by microscopical examination or by feeding experiments, whereas the cysticerci were all active after eight days in a portion kept unfrozen as a control. As 21 days in "coolers" is necessary to attain the same result, meat with slight infestation can be handled more rapidly by exposure to lower temperatures.

Coenurus.

The polycephalous tapeworm cysts, classed under the term *Coenurus*, which occur in the sheep, rabbit and gerbillus, are larval stages of Taenia species which, as adults, inhabit the dog. Twice only have coenuri been found in man. In 1913 BRUMPT described and figured a human infection of the brain with *Coenurus cerebralis*, and in 1919 TURNER and LEIPER recorded the presence of *Coenurus glomeratus* of the gerbille in a subcutaneous tumour excised from the intercostal muscle of a native of Northern Nigeria.

Taenia echinococcus (Hydatid).

Of the many clinical papers on hydatid which have appeared during recent years, that by REMLINGER (1918) is the only one of special interest in tropical pathology. In Tangiers, where hydatid is common, two cases occurred in which cysts opened into the bladder, resulting in chyluria. The pathology in these cases is apparently identical with that of filarial and bilharzial infections, and of non-parasitic tumours.

Hymenolepis diminuta.

This parasite normally inhabits the small intestine of the rat, and when infection occurs in man it is chiefly during the early years. Its presence is accompanied by few or no symptoms. De MAGALHÃES (1896) and NOC (1911) have noted the occurrence of enteritis in their cases. According to GONZAGA and CARVALHO (1918) its expulsion by treatment is difficult. In 1904 RANSOM collected from the literature 12 records of infestation of man. Since then additional cases have been described by DEADERICK (1906), GALLI-VALERIO (1910), LEIPER (1913) from Grenada, W.I., HOKI (1917) from the Loochoo Islands (2 soldiers), and GEDOELST (1920) from the Belgian Congo.

JOYEUX (1916, 1919, 1920) has studied the development of this species in detail, confirming the early work of GRASSI and ROVELLI (1888–92). In Italy the normal intermediate host would appear to be *Pyralis farinalis* (wrongly called *Asopia farinalis* by GRASSI and ROVELLI) in the adipose tissue of both larva and imago, often as many as 20 cysticercoids are found. The cysts also occur in the beetles, *Akis spinosa* and *Scaurus striatus*, and in the earwig, *Anisolabis annulipes*, common in Catania, Florence, Rome and Como. JOYEUX (1916) showed experimentally that *Tenebrio molitor* could be readily infected in the adult but not in the larval stage. The larvae only were susceptible in *Ceratophyllus fasciatus*, *Xenopsylla cheopis*, *Pulex irritans* and *Ctenocephalus canis*. Rats were readily infested when fed with infected specimens of these insects. Later, JOYEUX (1920) added to this list *Geotrupes sylvaticus*, which, however, he does not regard as a frequent intermediary. It is readily infected experimentally, but is not commonly available for the rat. He also infected *Ceratophyllus fasciatus* from Paris, Algiers and Salonica with equal ease, likewise *Xenopsylla cheopis*, *Leptosylla musculi*, *Pulex irritans*, *Ctenocephalus canis*, but failed to find actual infections in the fleas (*C. fasciatus*, *X. cheopis*, *L. musculi*) found on rats in Salonica, although larvae have been previously noted by NICOLL and MINCHIN (1910) (1911) in *C. fasciatus* in England, and JOHNSTON (1913) in Australia. The feeding of rats and mice with the eggs of *H. diminuta* failed to produce infection.

Hymenolepis nana.

The morphology and life-history of this species present characters of an unusual nature. Many have held that the adult worm in man is identical with *H. murina* in the rat. According to GRASSI, the life-cycle can complete itself in the intestinal mucosa of the rat, while NICOLL and MINCHIN (1911) and JOHNSTON (1913) claim to have obtained cysticercoids of this species in fleas. JOYEUX (1920) has reviewed the whole question in detail. His conclusion is that there is a slight but real difference between *H. nana* and *H. murina* (now named *H. fraterna*, Stiles, 1906), based on the suckers and the hooks, but these cannot be applied with success to the diagnosis of individual specimens. His attempts to infect larvae of fleas were entirely negative, and he suggests that the larvae found by NICOLL, MINCHIN and JOHNSTON are those of *Hymenolepis microstoma* of the rat. He confirms the main points of GRASSI and ROVELLI's work on direct infection of the definitive host. The cysticercoid is completely developed in the intestinal villi of the rat 100 hours after infection with the eggs from a rat. The worms attain sexual maturity in 14–20 days. He agrees with GRASSI and ROVELLI that direct infection is the *only* method of transmission.

JOYEUX (1920) relates a series of 22 experiments on rats with material from three human cases of *H. nana* infection from West Africa, Algiers and Belgium respectively. In every case the animals were uninfected with the human material, but were afterwards successfully infected with eggs of the rat (*H. fraterna*) cestodes. SCHNELL (1918) failed to obtain experimental infection in mice with human material. SAEKI (1920) swallowed over 1,000 eggs of *H. nana* at a time without result, but succeeded in infecting a girl four years old. The geographical distributions of *H. nana* (of man) and *H. fraterna* (of the rat) are not identical. JOYEUX (1920) points out that *H. nana* has only been recorded five times in man in France, while of the rats of Paris 20·79 per cent. are infested. *H. fraterna* is found without difficulty wherever it is looked for, all over the world. *H. nana* is limited to warm countries, frequent in the regions bordering the Mediterranean, in Asia, Africa, and seemingly in Oceania.

Incidence.—HASEGAWA and YAMANOUCHI (1918) found five cases among 7,094 hospital patients in Tokio. In one case 4,078 tapeworms were present. MAPLESTONE (1920) states that WAITE found 51 cases among 14,577 persons in North Queensland. STEWART (1916) recorded eight cases out of 320 sepoys in the Indian garrison at Hong Kong. In Brazil, CARINI and MASTRANGIOLI (1912) have seen eleven cases since 1908. BETTENCOURT (1916) gives *H. nana* as the commonest tapeworm in Portugal; 33 out of 503 children were found infected when examined for the parasite.

Dipylidium caninum.

BLANCHARD, LEROUX and LABBÉ (1914) find that 76 authentic cases in man have been reported from various parts of Europe, United States, Venezuela and South Africa. Further cases have been recorded since by (*a*) VINCENZO (1914), in a child four years old, from Offida (Ascoli), in Italy; (*b*) MENDOZA-GUAZON (1916), in a child eight months old, in the Philippines; (*c*) ANCONA (1916), in a girl, aged five, in Italy. LEIPER (1921) exhibited at the Royal Society of Medicine a specimen obtained by Captain Norman HALL from an old woman in German East Africa.

JOYEUX (1920), repeating early work on transmission, finds that the adult fleas cannot take up the eggs. These are eaten by the larvae at an early age, but the development from the hexacanth embryo, which lies in the adipose tissue muscles of the flea, is delayed until the imago is reached, when development then proceeds to the infective stage.

Davainea madagascariensis.

In 1916 BLANCHARD extended his previous notes on the morphology of *D. madagascariensis* by describing more fully the head, which bears about 110 hooks arranged on at least five concentric rows in the suckers. AKASHI (1916) described as a new species *Davainea formosana*, a strange tapeworm found in a child in Formosa. The strobila measures 43 cm. in length; the globular head has unarmed suckers and the hemispherical rostellum bears two rows of numerous rose-thorn hooks. The egg-masses are often irregular, sometimes polygonal in shape, and the eggs measure 0·046 mm. But these differences do not appear to justify the creation of a new species.

Bertiella satyri.

This parasite, hitherto known only from the orang-outang of Borneo, has been identified by BLANCHARD (1913) in several fragments of tapeworm obtained from the stools of a girl, aged eight, living at

Port Louis, in Mauritius. It was claimed that the discovery of *B. satyri* in areas so widely separated as Mauritius and Borneo was no more remarkable than that of *Davainea madagascariensis* in Comoro, Mauritius, Siam and British Guiana ; but in the latter case the only known host is man, and the case in British Guiana occurred in indentured Indian labour.

Dibothriocephalus latus.

In 1916 SINGER estimated that only 30 cases of Bothriocephalus infection had been recorded in the United States of America, and that one only of these was American born. As NICKERSEN had frequently found the larvae of *B. latus* in fish caught in the great lakes, it seemed probable that its occurrence had been overlooked. In 1919 RILEY cited two cases, both children, who had acquired the infection in Minnesota, where they had spent the whole of their lives. In the same State, NICKERSEN (1920) recorded four endemic cases, and gave the opinion that this tapeworm is as common as the other tapeworms of man in this region. O'FARRELL (1918) described a case from near the River Shannon, in the County of Leitrim, Ireland, and refers to a previous unrecorded case. G. RAILLIET (1913) removed a specimen from a woman who had always lived in the environs of Paris.

The morphology of the parasite is already well known, but MAGATH (1919) has made a valuable study of the eggs, from which he concludes that these vary so greatly in size that this character is of no great value for identification, but that the egg-shell possesses, however, a distinctive morphology. LEON (1916) described, under the name *Bothriocephalus taenioides*, a worm from Roumania, which at first sight resembled a portion of a Taenia, but which on further examination seemed to be a misshapen *B. latus*. In 1920 he recorded a second case ; the portion of worm found presented the same characteristics. The author contrasts his specimen with *D. parvus*, Stephens, 1908. We are of opinion that neither of these species is valid, but both represent young or abnormally extended specimens of *D. latus*.

CHOLODKOVSKY (1916) names a single specimen *D. minor* n. sp. The uterus is said to have an irregular sac-like outline, not the characteristic rosette of *D. latus*.

The most important experimental work upon cestode development during the past 10 years is undoubtedly that of ROSEN and JANICKI on Dibothriocephalus. JANICKI (1917) shows that the embryos hatch from the eggs in from 13 days to 5 weeks at summer temperature, and that young trout and pike, perch and turbot were not infected when exposed to actively swimming onchospheres. From these negative results JANICKI concluded that an undiscovered host acted as the first intermediary and that the fish were only the second intermediate hosts. ROSEN (1917), acting in conjunction with JANICKI's researches, attempted without success to infect experimentally Gammarids, Chironomus, Corethra, Oligochaets, *Cyclops orthonoides*, *C. macrurus*, *C. vernalis*, *C. leuckarti*, *C. viridis*. Later, ROSEN (1917–18) succeeded in infecting *Cyclops strenuus* and *Diaptomus gracilis*. After two or three weeks the larva appeared to have attained its full development within its first intermediary and measured 0·5 mm. Young trout became infected after feeding upon the experimentally infected crustacea. With Dibothriocephalus eggs from the faeces of a dog GALLI-VALERIO (1919) successfully infected *Cyclops strenuus*, thus confirming ROSEN's observations.

Sparganum mansoni.

According to YOSHIDA (1917), 55 cases of *Sparganum mansoni* occur in medical literature. The majority of these were reported from Japan. To these MATSUHARA (1916) adds a further case under the name *Taenia lingula.* MOORE (1914) described a specimen measuring 21·5 cm. accidentally removed from cancerous masses in the breast of a native of Texas, the first recorded from the New World. To the two cases previously recorded from Australia, CLELAND (1918) added a third, withdrawn from a small inflammatory swelling on the leg of a patient living at Sydney. CASAUX (1914) observed ocular sparganosis in the vicinity of the Tonkin delta, and described eight cases which had come under his personal observation. The infection manifested itself by pain, redness and lachrymation of the eye, associated with extreme ptosis of the upper lid, which was swollen and oedematous. The parasite was enclosed in fibrous nodules in the eyelid. Notes of three additional cases of ocular infection were published by GAIDE and RONGIER (1915). These cases came under their notice at the Central Hospital at Hanoi, the capital of Annam, where a further case was reported by MOTAIS (1920), who states that similar worms occur in pigs in Annam. Several attempts have been made to link the Sparganum with Dibothriocephalus, for morphologically *Sparganum mansoni* resembles an overgrown Plerocercoid. YAMATA (1916) found a strap-shaped worm in the abdominal cavity of a woman and introduced this into the stomach of a small dog. Thirteen days later eggs were found in the dog's faeces. After two months the dog was killed and a large Bothriocephalus was found. YOSHIDA (1917) found 36 specimens of Sparganum in the body-cavity and body-wall of an emaciated cat and fed these to two young cats. Five days later, however, no worms could be found in the gut of the cats. Later, a specimen of *Sparganum mansoni,* which was obtained from a human patient, was fed to a laboratory dog 27 days old. Two months later a Dibothriocephalus 2·5 metres long was recovered. The eggs of this tapeworm differed markedly from those of *D. latus.*

OKUMURA (1919) has found larval cestodes in monkeys, cats, pigs, rats, domesticated fowls, ducks, snakes and frogs in Japan. The dog is infected with a Dibothriocephalus apparently identical with that reared experimentally in dogs by YAMATA (1916) and YOSHIDA (1917) from human Sparganum material. From the ova he succeeded in infecting *Cyclops leuckarti,* which, according to ROSEN and GALLI-VALERIO, is resistant to infection with *D. latus.* In the snake, *Elaphis climacophorus,* and in the frogs of Japan a Plerocercoid occurs which closely resembles human Sparganum. By feeding these to a dog the author obtained adult Dibothriocephalus which gave rise to eggs identical with those obtained by feeding dogs with the human Sparganum. Moreover, when mice and frogs were experimentally fed upon infected cyclops the Procercoids having pierced the gut were able to live in the body-cavity.

Sparganum prolifer Ijima 1905.

A second and third case of *S. prolifer* have been found in Japan by YOSHIDA (1914), and KODAMA (1917) described the histological changes in what would appear to be another case. STILES (1908) has described a further specimen which had been removed from under the skin of a fisherman in Florida (U.S.A.) by Dr. GATES.

REFERENCES.*

Taenia.

Bettencourt (1913), ii, 181.
Christopherson & Izzedin (1918), xii, 191.
Dupont (1917), x, 124.

Cysticercus.

Abbott (1921), *Lancet*, ii, 956–7.
Fontan (1919), xiv, 146.
von Graefe (1866), *Arch. f. Ophth.* Berlin, xii, 174–198.
von Herrenschwand (1916), ix, 276.
Hughes (1921), *Lancet*, ii, 956.
Pillat (1920), *Wien. Klin. Woch,*, xiv, 925–7.
Ransom (1914), iv, 520.
de Schweinitz & Wiener (1919), xv, 222.
Vasilin (1921), *Presse Méd.*, 522–3.
Waterhouse (1913), ii, 408.

Coenurus.

Brumpt (1913), *Précis de Parasitologie*, 2nd edit.; also 3rd edit. (1922), pp. 441–3, figs. 236–7.
Turner & Leiper (1919), xv, 223.

Taenia echinococcus.

Remlinger (1918), xiii, 208.

Hymenolepis diminuta.

Deaderick (1906), *Jl. Amer. Med. Assoc.*, xlvii, 2087–90.
Galli-Valerio (1910), *Cent. f. Bakt.*, Orig., liv, 44.
Gedoelst (1920), xvi, 143.
Gonzaga & Carvalho (1918), xiv, 148.
Grassi & Rovelli (1892), *Atti. Accad. Gioenia Sci. Nat. Catania*, An. 68, 4 Ser., iv, 2 mem., 108 pp.
Hoki (1917), x, 124.
Johnston (1913), iii, 291.
Joyeux (1916), viii, 512.
—— (1919), xiv, 146.
—— (1920), *Bull. Biol. France et Belg.*, Suppl. II.
Leiper (1913), ii, 626.
de Magalhães (1896), *Cent. f. Bakt.*, Orig., xx, 673–674.
Nicoll (1911), *Brit. Med. Jl.*, i, 621.
—— & Minchin (1910), *Abstracts Proc. Zool. Soc., Lond.*, Nov.
—— & —— (1911), *Proc. Zool. Soc., Lond.*, 9–13.
Noc (1911), *Bull. Soc. Path. Exot.*, iv, 390–5.
Ransom (1904), Bull. No. 18, *Hyg. Lab. Wash.*, 98–101.

Hymenolepis nana.

Bettencourt (1916), viii, 513.
Carini & Mastrangioli (1912), ii, 181.
Grassi & Rovelli (1892), *Atti. Accad. Gioenia Sci. Nat. Catania.*, An. 68, 4 Ser., iv, 2 mem., 108 pp.
Hasegawa & Yamanouchi (1918), xvii, 68.
Johnston (1913), iii, 291.
Joyeux (1920), *Bull. Biol. France et Belg.*, Suppl. II.
Maplestone (1920), xviii, 111.
Nicoll & Minchin (1910), *Abstracts of Proc. Zool. Soc. Lond.*, Nov.
—— & —— (1911), *Proc. Zool. Soc. Lond.*, 9–13.
Saeki (1920), xviii, 112.
Schnell (1918), xiii, 208.
Stewart (1916), viii, 192.

Dipylidium caninum.

Ancona (1916), viii, 514.
Blanchard, Leroux & Labbé (1914), iv, 100.
Joyeux (1920), *Bull. Biol. France et Belg.*, Suppl. II.
Leiper (1921), *Proc. Roy. Soc. Med.*
Mendoza-Guazon (1916), viii, 514.
Vincenzo (1914), iv, 100.

Davainea madagascariensis.

Akashi (1916), x, 123.
Blanchard (1916), viii, 513.

Bertiella satyri.

Blanchard (1913), ii, 408.

Dibothriocephalus latus.

Galli-Valerio (1919), xvi, 142.
Janicki (1917), xi, 93 ; xvii, 64.
—— (1919), xvii, 66.
—— & Rosen (1917), xvii, 64.
Leon (1916), x, 123.
—— (1920), xvii, 67.
Magath (1919), xv, 221.
Nickerson (1920), xvii, 68.
O'Farrell (1918), xii, 191.
Railliet (1913), iii, 291.
Riley (1919), xv, 222 ; xvii, 67.
Rosen (1917), xvii, 64.
—— (1918), xvii, 66.
Singer (1916), x, 192.

Dibothriocephalus minor.

Cholodkovsky (1916), xix, 669.

Sparganum mansoni.

Casaux (1914), vii, 354.
Cleland (1918), xiii, 207.
Gaide & Rongier (1915), vii, 353.
Matsuhara (1916), x, 124.
Moore (1914), vi, 301.
Motais (1920), xvi, 143.
Okumura (1919), xv, 222.
Yamata (1916), x, 123.
Yoshida (1917), xi, 94.

Sparganum prolifer.

Kodama (1917), xiii, 208.
Stiles (1908), Bull. No. 40, *Hyg. Lab. Wash.*, 5–18.
Yoshida (1914), iv, 519.

---

* References are to summaries in the *Tropical Diseases Bulletin* unless otherwise stated. Dates in parentheses refer to year of publication of original papers.

KALA AZAR.

INDIAN MEDICAL GAZETTE. 1922. June. Vol. 57. No. 6. pp. 221–224.
The Problems of Kala-Azar.

This leading article on the problems of kala azar covers much the same ground as the review which follows. One or two points seem worthy of note. A protest is made against the treatment of diseases which are suspected as being possibly kala azar without the discovery of the parasite. The writer says:—" It is distressing to reflect on the thousands of cases which are to-day submitted to the long and tedious antimony treatment necessary to cure, without the diagnosis having been proved." The present position of the treatment of the disease by intravenous injections of tartar emetic cannot be regarded as satisfactory. It is exceedingly difficult to get patients to submit to the long course, while the view that the administration of a total of 200 cc. of 1 per cent. solution of tartar emetic will bring about a cure is found to be erroneous. There are cases which resist this quantity of the drug, and it appears that certain strains of *Leishmania donovani* are more resistant than others. The discovery of some antimony compound suitable for intramuscular use is urgently needed.

The investigations connected with the bed bug are reviewed and it is asked if the present position with regard to investigation of kala azar in India is satisfactory. Independent investigators are attacking the problem in various areas but the time has come for co-operation, and the approach of the subject with a clean slate, unoccupied by preconceived ideas and conceptions, offers a better chance of solution of the problem of kala azar, which remains to-day the most outstanding one in tropical medicine.

C. M. Wenyon.

MACKIE (F. P.). **The Problem of Kala-Azar.**—*Indian Med. Gaz.* 1922. Sept. Vol. 57. No. 9. pp. 326–331. With 1 plate.

In this interesting summary of facts which have a bearing on the problem of the possible mode of spread of kala azar, the writer considers the subject with an open mind. The more he sees of the disease the more chary does he become of excluding a diagnosis of kala azar on clinical grounds alone. The final diagnosis must be made by the discovery of the parasite by examination of the peripheral blood and spleen puncture fluid in smears or by the culture method. The newly introduced formol-gel test promises to be of great assistance, but at present its limitations and errors are not known.

The escape of leishmania from the body for infection of another host may conceivably take place from the skin or intestine, as the parasites occur in lesions in both these situations, but their presence in the blood is strongly suggestive of the possibility of their being taken up by some insect. The discovery of small bodies in the salivary glands of bugs by Mrs. ADIE and the author's confirmation of this, inclines him to the belief that a hitherto unknown stage of the leishmania has been discovered. [This statement was evidently made before it was known that these particular bodies were probably microsporidia, as CHRISTOPHERS has pointed out.] The discovery of the " thick-tailed " form of leishmania in the bed bug by CORNWALL and the intracellular development in the same host as elucidated by

Mrs. ADIE and PATTON, appear to be in favour of the bug transmission hypothesis, but it is emphasized that the supreme test of feeding large numbers of heavily infected bugs on a human being which PATTON and his assistant say they have done on themselves, has never led to infection of either of these intrepid investigators. The sand-fly, which is the probable vector of oriental sore, deserves more attention from the point of view of kala azar. The fly is known to occur in Assam and has been taken in kala azar houses. A fly from such a house was found to be infected with flagellates [but the reviewer saw films of this flagellate, which is a crithidia and not a leptomonas]. The sand-fly, however, is known to harbour a leptomonas. The bug *Conorrhinus rubrofasciatus,* first suggested as a possible agent by DONOVAN, is mentioned. The flagellates in these bugs are crithidia and not leptomonas. A laboratory-bred nymph was found infected with this flagellate 17 days after feeding on a kala azar case. It is hardly possible that the crithidia were developed from the leishmania, and it is suggested that the bug may have acquired its infection hereditarily, but the author does not state whether the nymph had an opportunity of feeding on the faeces of the adult, a habit which BRUMPT has shown Reduviid bugs to possess.

The susceptibility of laboratory animals to *Leishmania donovani* in India is considered. It has been found that a transient infection is more common than has been suspected. Thus, by adopting the culture test for infection it has been shown that the guinea pig, rabbit and monkey may be infected. Two guinea-pigs gave a positive culture on the eleventh day, the monkey on the thirty-sixth day, and the rabbit (anterior chamber of the eye) on the fourth and nineteenth day. A mouse which had been injected with the alimentary contents of five bugs fed seventeen days before on a case of kala azar was found after death to contain leishmania.

Under the heading of treatment the dangers of incomplete cure are emphasized. The patient, much improved in health though still harbouring leishmania, may be received back by his friends while he is acting as a carrier of the disease.

C. M. W.

NAPIER (L. E.). **Annual Report of the Work of the Kala Azar Research Laboratory during 1921.** *Ann. Report of Work done in the Calcutta School of Trop. Med. and Hyg. under the Endowment of the Indian Tea, Jute and Mining Association.* pp. 1–36. With 1 chart.

This report, if it serves no other purposes, emphasizes the great difficulties which attend kala azar investigations in India. Attempts to secure easily-handled strains of *Leishmania donovani* in experimental animals have, as is the experience of many other workers, been attended with disappointing results. Two *Macacus rhesus* were infected, but these animals were apparently unaffected by the presence of the parasite and appeared to recover. One puppy became infected and died presumably of the disease. Keeping vermin-free monkeys together in a cage, one being infected and the other not, keeping monkeys under similar conditions though not freed from lice, and the feeding of batches of bugs on an infected monkey and then on an uninfected one, gave only negative results. An experiment in which bugs were fed on infected spleen juice and then on a monkey likewise produced no infection.

An attempt was made to infect bugs by injecting spleen pulp per rectum. In some cases unchanged leishmania were found in the rectum within three days of the injection, but no developmental forms were observed.

The globulin precipitation test for kala azar suggested by BRAHMACHARI and the haemolytic test of RAY were investigated, but it was found that neither was specific for kala azar. The aldehyde test, details of which have been noted in another paper [see this *Bulletin*, Vol. 19, p. 546] gave better results and the statement is made that there is every reason to believe that a definitely positive aldehyde reaction is absolutely diagnostic of kala azar.

A number of pharmacological experiments were undertaken with the object of discovering a "scale" preparation of antimony tartrate which would produce the minimum reaction when given either intravenously or intramuscularly. A notice of these has already appeared in another paper (this *Bulletin*, Vol. 19, p. 550). As regards the cases actually treated, of 19 cases who were given intravenous potassium antimonyl tartrate 13 were discharged cured, 2 died under treatment, and 4 had an uncompleted course. With intravenous sodium antimonyl tartrate 1 was cured, while with intramuscular "scale" sodium antimonyl tartrate, of 10 cases treated 7 were cured, 2 had an incomplete course and 1 died. Treatment by intravenous stibenyl is mentioned, but another paper reviewed in this number gives more details of the cases.

In the concluding remarks it is pointed out that kala azar is essentially a disease of small rural communities and not of towns, and though the bug as agent of transmission carries the heaviest weight of suspicion the case against it has not been proved. It exists in greater millions in towns than in rural districts. The one evident factor which is present in towns and absent amongst rural communities is sanitation.

C. M. W.

ASSAM. **Annual Public Health Report of the Province of Assam for the Year 1921.** [YOUNG (T. C. McCombie), Director of Public Health.]—pp. ii + 34 + 3. 1922. Shillong: Assam Secretariat Press. [Price 12 annas=1*s*. 6*d*.]

The recorded mortality from kala azar in Assam for the year 1921 is slightly higher than in the previous year. This is to be accounted for by the rise in the number of deaths in Nowgong and the increased efforts which have been put forth in Sylhet, which have resulted in more accurate diagnosis of the cases of fever. The numerous hospitals and dispensaries which have been set up to cope with the disease have treated during the year 15,880 cases, some of which, it is admitted, may have been cases of chronic malaria. Absolute diagnosis has not been possible in all cases, but it is hoped that the new formol-gel test for kala azar will do much to eliminate this error. Recurrence of infection occurred in a small number of fully treated cases, but this is not surprising, as in the plains the patient returns to his already infected home, the plains man finding it much more difficult to abandon his old home for a new one than the dweller in the hills. The hill man himself usually turns a kala azar patient out of the village and burns his house, with the result that he seeks admission to hospital. In the plains this custom does not obtain. The effect in the North Cachar Hills is that the outbreak appears to be extinguished. The outlook is a very hopeful one and the writer speaks with satisfaction of the stimulating sight of troops of patients, mostly children, who attend the clinics for a treatment in which the chances of recovery are equal to what were formerly the probabilities of death.

C. M. W.

AWATI (P. R.). **Survey of Biting Insects of Assam with Reference to Kala-Azar for the Whole Year from November 1921 to October 1922.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 579–591. With 4 figs.

With the object of obtaining some light on the etiology of kala azar, an investigation of the biting insects associated with human beings and their habitations in Assam was undertaken. Two areas were studied, one in which kala azar was endemic and the other which was free from the disease.

The climate of Assam shows a dry season corresponding with the winter and spring in England and a wet season during the remainder of the. year. Throughout the year in the areas investigated the humidity was high. All villages, especially those in the kala azar area, are near to water, and almost every village in the infected area is surrounded by dense groves of bamboos. The drinking water is usually dirty and it is not generally stored in the house for more than 24 hours. It results that mosquitoes do not breed in the storage vessels. Bed-bugs appear to be equally distributed in both the infected and the uninfected areas, but there is a great difference between the wet and dry seasons. The high continued temperature, combined with the humidity, may account for the decrease in their number during the wet season. Pediculi are less in the infected area than in the uninfected area, and there was no seasonal variation in their incidence. The Reduviid bug, *Conorhinus rubrofasciatus*, is found in the infected area throughout the year, but it has not yet been found in the uninfected area. Sand-flies (*Phlebotomus*), ticks, mites (*Trombidium*), fleas and certain Reduviid larvae covered with mud, which do not appear to be those of Conorhinus, occurred in both areas.

C. M. W

PERRY (H. Marrian). **Some Observations on the Occurrence of *Leishmania* in the Intestinal Tissues in Indian Kala-Azar, on the Pathological Changes occasioned by their Presence, and on their Possible Significance in this Situation.**—*Jl. Roy. Army Med. Corps.* 1922. Nov. Vol. 39. No. 5. pp. 323–329. With 3 figs.

The examination of sections of the small intestine of two cases of kala azar revealed the fact that in both a remarkable change had taken place in the villi. These structures had become swollen peripherally and appeared as polypi connected with the submucosa by narrow peduncles of little more than fibrous tissue. The columnar epithelium and basement membrane were usually intact, though in some cases they were not so, but the most striking change was that the villi were filled by enormous numbers of endothelial cells which, especially towards the centre, were packed with leishmania. In some cases the cells had broken down and the parasites were distributed amongst the cellular debris. Parasites were present in endothelial cells in the submucosa in smaller numbers, but this layer of the intestinal wall was otherwise normal in appearance. Though other observers have noted the presence of leishmania in the intestinal wall, nothing comparable with the changes and intense infection here described has been recorded.

The presence of such a condition naturally raises some interesting questions, which are discussed. One of the striking features of kala azar is the extreme emaciation of the patients, and it is suggested that the profound alteration of the intestine, which interferes with absorption, may account for this. The presence of such large numbers of parasites in the villi—some of which are breaking down, so that the infected cells are liberated into the lumen of the intestine—shows that parasites may escape from the body in this way in considerable numbers. The possibility of some resistant forms being found in the faeces and leading to the spread of infection owing to absence of all conservancy methods, as in Assam, or through some faecal feeding insect, has to be considered.

C. M. W.

NICOLLE (Charles); CALAMIDA (F.); MACOTTA; VILLAIN (Georges); SPEZZAFUMO (U.). **Chronique du Kala-Azar en Tunisie: LX^e & LXI^e. Observations tunisiennes de Kala-Azar (Résumée): LXII^e Observation tunisienne de Kala-Azar (Cas observé à Degache, sud tunisien, et traité par le trépol): Observation d'un cas de Kala-Azar contracté en Sicile et reconnu en Tunisie.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 230–239. With 2 charts in text.

The history of kala azar in Tunis is continued in this report [see this *Bulletin*, Vol. 18, p. 238]. Three new cases of infantile kala azar are recorded, one which originated in Southern Tunisia, at Degasche, being the first from a district so far south. The total number of cases observed in this endemic area since 1906 is 62.

Canine kala azar still occupies attention. Of 170 dogs examined between January 11 and March 14 one was found infected, thus giving a total of 75 cases of the canine disease met with in Tunis since November 8, 1920.

It was previously announced that spleen puncture had been performed in 113 cases of splenic anaemia without any causative organism being found. A further 12 cases have been thus examined without any light being thrown on the cause of the disease. One of the kala azar cases was treated with intramuscular injections of 1 cc. of trepol given at four or five days' intervals. During the month of treatment the child improved considerably, the temperature becoming normal. The child died, however, of an acute diarrhoea. Leishmania had been found in spleen puncture made five days before death. The authors consider that the drug had a real therapeutic effect, which was evident in spite of the fact that the case was an unfavourable one for treatment in that the disease had already run a course of 13 months.

Both the other cases died, as did also a fourth case in which the disease had been contracted in the province of Palermo.

C. M. W.

VAGLIO (R.). **Trasmissione della Leishmaniosi interna.**—*Pediatria.* 1922. Aug. 1. Vol. 30. No. 15. pp. 728–734.

This paper contains a summary of the observations made by various observers regarding the vexed question of the mode of transmission of kala azar. It contains nothing new, but the records, which are briefly stated, are intended to assist those who wish to follow up the investigation.

C. M. W.

CARONIA (J.). **De la ponction de la rate et de la moelle osseuse.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 722–729. With 5 text figs.

The author from a large experience of the operation of spleen puncture for the diagnosis of infantile kala azar in Italy has elaborated what he regards as the least dangerous and the most simple technique. To reduce to a minimum the dangers of laceration of the spleen it is necessary to avoid hindering the movements of the needle which are caused by the respirations of the patient. The use of a needle fixed to a syringe forms an immobile system which is liable to cause a tear in the spleen. Accordingly the author advises the use of a fine, long needle alone, with no syringe attached. A No. 12 needle, 7 to 9 cm. in length, is suitable for the purpose. The patient lies on the bed on his back, or, in the case of small children, in the arms of a nurse. With the left hand the spleen is pressed upwards to render it immobile and the needle is introduced only through the skin perpendicular to the surface. An interval is allowed to elapse to enable the patient to become composed after the shock caused by the puncture of the skin. The needle is then pushed forwards into the spleen and allowed to move naturally with the respirations. No syringe is attached and no aspiration is necessary. It is then withdrawn and it will be found that sufficient material adheres to the point to make the necessary films. Material in the needle may be driven out with the stylet. By this technique it is claimed that blood is not sucked into the needle and that the material obtained consists of spleen pulp alone, so that more rapid and accurate diagnosis is made.

The author then goes on to describe an operation for puncture of the bone for obtaining marrow, an operation which is of value especially in case of haemophilia, where spleen puncture is contra-indicated. There is no danger attaching to the operation, which is a very simple one in the case of children. The one disadvantage is that there is a greater tendency to the extraction of blood with the marrow, so that the discovery of the parasites in the films may not be so easy as after spleen puncture. The site selected is the upper epiphysis of the tibia between its external and anterior surfaces. A stout needle or small trochar is employed, and this, with the stylet in position, is introduced obliquely from above downwards through the skin and forced through the surface of the bone. Entry into the cavity is easily felt by the sudden loss of resistance. The mouth of the needle is probably blocked with particles of bone and these are dislodged by withdrawing the needle very slightly and clearing the débris away by use of the stylet. When this has been done the needle is quickly withdrawn and sufficient marrow will be found adherent to it to enable films to be made.

C. M. W.

BANERJI (Dhirendra Nath). **An Announcement. A Preliminary Note on the Diagnosis of Kala-Azar by Examination of Bone-Marrow.**—Reprinted from *Calcutta Med. Jl.* 1922. Apr. Vol. 16. No. 10. 1 p.

The author announces what he regards as a simple and safe method of examining for leishmania in cases of suspected kala azar by obtaining marrow from the sternum. The anterior plate of the gladiolar portion of the sternum is opened by means of a Southey's trochar and material obtained from within the bone by means of a hypodermic syringe. He has obtained parasites from all the cases of kala azar he has examined. A full report of the results of his investigations will be published later.

C. M. W.

AYYAR (T. Seethapathy) & KRISHNAN (K. V.). **The Value of Culture of the Peripheral Blood in Kala-Azar as a Diagnostic Procedure.**—*Indian Med. Gaz.* 1922. July. Vol. 57. No. 7. pp. 255–256.

This paper gives the results of the examination by the culture method on N.N.N. medium of 49 samples of blood taken from the veins of cases of suspected kala azar. Of the 49 cases 9 were eventually found to be some other disease while the diagnosis of kala azar was regarded as correct in the other 40, of which 5 were proved cases in which puncture of the spleen had been performed. From the 40 samples of blood, cultures on N.N.N. medium were obtained in 25 per cent. The technique employed was that recommended by CORNWALL. As a rule, the tube must be kept for at least 20 days before a negative result can be accepted, but in one case a tube showed flagellates on the fortieth day, though it had been previously negative.

C. M. W.

MILIO (Giulio). **Su una siero-reazione precipitante nella diagnosi di Leishmaniosi.**—*Pediatria.* 1922. Oct. 15. Vol. 30. No. 20. pp. 957–959.

The publication by BRAHMACHARI of an account of a new test for kala azar which was described in 1917 (this *Bulletin*, Vol. 11, p. 152) and more fully in his book " Kala-Azar and its Treatment," led the author of the paper under review to investigate the reaction in cases of kala azar in Italy. In a Wassermann tube was placed 1 cc. of serum and above the serum 2 cc. of distilled water. The reaction was positive when a ring of turbidity formed at the line of contact of the two fluids. A positive result was obtained in 14 consecutive cases of kala azar, while in 14 controls, including a case of splenic anaemia, it was entirely negative.

C. M. W.

i. BESSEMANS (A.). **Influence de la concentration des sérums sur leur formolgélification et sur leur pouvoir formolgélifiant. Influence de la température sur leur formolgélification.**—*C. R. Soc. Biol.* 1922. July 1. Vol. 87. No. 24. pp. 398–401.

ii. BESSEMANS (A.). **Influence de la dilution sur le pouvoir formolgélifiant des sérums.**—*Ibid.* pp. 401–404.

These papers describe changes undergone by the various sera after concentration by evaporation and the addition of salts which modify the property they possess of jellying after the addition of formol. The power of jellying of a serum is increased by evaporation of the serum in the cold before the addition of formol. Certain sera which do not jelly in their natural condition acquire this property when concentrated. Similarly the power of jellying is increased by the addition of salts such as $(NH_4)_2$ SO_4, Na Cl and $MgSO_4$. As regards temperature it was found that no relation existed between the minimum temperature at which any particular serum would solidify and its jellying on the addition of formol.

C. M. W.

COMBIESCO (D.). **Recherches sur la gélification du sérum par l'aldéhyde formique chez des animaux en état d'anaphylaxie.**—*C. R. Soc. Biol.* 1922. July 8. Vol. 87. No. 25. pp. 416–417.

The interest aroused by the proposed formol-gel test for kala azar warrants a notice of the above paper. The author has shown that formol will jelly the serum of cases of scarlatina and erysipelas. The reaction depends upon the unstable condition of equilibrium of the colloidal substances in the serum. The serum of a normal guinea pig does not give the reaction, whereas the serum of guinea pigs rendered unstable by the production of a condition of anaphylaxis does so. The reaction is most marked during the actual anaphylaxis shock.

C. M. W.

GATÉ (J.) & PAPACOSTAS (G.). **La formol-gélification des sérums dans diverses maladies.**—*C. R. Soc. Biol.* 1922. July 15. Vol. 87. No. 26. pp. 543–544.

The authors have tested the formol-gel reaction of the sera from a large number of diseases. Each serum was put up with 2, 3, 4 and 5 drops of formol per cc. of serum and the readings were made at the end of three days. It may be noted that a positive result was obtained in syphilis in 50 per cent. of the cases, and in nearly all cases of erysipelas. In typhoid fever and pneumonia it was usually negative.

C. M. W.

DE BUEN (Sadi). **Un caso de Kala-Azar en la provincia de Cáceres.**—*Arch. de Cardiología y Hematología.* Madrid. 1922. June. Vol. 3. No. 6. pp. 205–208. With 2 charts and 3 figs.

LUENGO (Pablo), DE BUEN (Sadi) & LUENGO (Emilio). **Siete casos de Kala-Azar infantil. (Provincias de Cáceres y Toledo).**—*Ibid.* Oct. No. 10. pp. 369–383. With 14 text figs.

During the antimalaria campaign which was commenced in the Province of Cáceres in Spain, in 1920, cases of splenomegaly were encountered which did not respond to quinine treatment.

The first paper describes one such case which was finally diagnosed by spleen puncture as infantile kala azar.

The second paper redescribes this first case and in addition six others. The disease appears to be typical of the infantile form of kala azar of the Mediterranean basin.

C. M. W.

CAMPANA Y CASSI (T.). **Le kala-azar infantile dans la province de Tarragone.**—*Rev. Méd. et Hyg. Trop.* 1922. May–June. Vol. 14. No. 3. pp. 71–72.

This paper records two cases diagnosed as kala azar in children in the Province of Tarragona, in Spain. No mention is made of the discovery of leishmania. One of the cases died, while the other is said to have recovered rapidly after treatment with "914."

C. M. W.

FRANCO (Enrico Emilio). **Le alterazioni spleniche nella Leishmaniosi infantile.**—Reprinted from *Jl. de Sci. Mat. Fisicas e Naturais.* 1922. 3rd Ser. No. 11. 40 pp. With 9 figs.

The author has conducted a minute investigation of the changes undergone by the spleen in ten cases of infantile kala azar. As in his previous papers on the histo-pathology of kala azar noted in this

Bulletin, he discusses in detail the various types of cell which he has encountered and in so doing he employs names which convey no meaning to the reviewer who, however, cannot claim any knowledge of the intricate subject of applied haematology. The function of these cells is discussed, while the possible rôle they fulfil in the pathology of the disease has afforded him a field for speculations which may be of interest to those with a knowledge of the subject, but hardly so to the medical man whose duty it is to handle kala azar in a practical manner. Anyone interested in the subject must obtain the original article.

C. M. W.

CASTORINA (Giuseppe). **Sul contenuto in colesterina del siero di sangue nella leishmaniosi infantile.**—*Pediatria.* 1922. Nov. 15. Vol. 30. No. 22. pp. 1076–1080.

In five normal children it was found that the cholesterin constituent of the blood varied from 1 to 1·68 parts per thousand, which agrees with the generally accepted figures. In eighteen cases of infantile kala azar there is considerably less, the quantity varying from 0·5 to 1·4 parts per thousand. A similar diminution is noted in other diseases associated with profound anaemia. In treated cases of kala azar the quantity of cholesterin increases as recovery takes place.

C. M. W.

MALLARDI (Mario). **Contributo statistico-clinico alla terapia specifica della Leishmaniosi interna.**—*Pediatria.* 1922. Oct. 1. Vol. 30. No. 19. pp. 889–897.

In this *Bulletin* (Vol. 17, p. 358) a paper by FOTI and JAVARONE was reviewed containing an account of 75 cases of kala azar treated in Professor JEMMA's clinic in Naples, from 1914 to 1920. The present paper records the results of the treatment of a further 77 cases, 72 of which were treated with tartar emetic and 5 with stibiacetin. Comparing this series of cases with the former described by FOTI and JAVARONE, it is noted that there is a distinct inprovement in the results obtained. In place of a mortality rate of 23 per cent. there is one of 14·3.

The maximum dose of drug for a child under 3 years of age is 3–4 cgm., for a child over 3 years of age 4–5 cgm. The course of injections extends over three months.

From the tables which accompany the paper it is seen that, though the five cases treated with stibiacetin are all recorded as having recovered, the last case in which this drug was used was the twelfth in the series, all subsequent cases being treated with tartar emetic. It would seem that for some reason not explained in the paper, tartar emetic was preferable.

C. M. W.

NAPIER (L. E.). **A Report on the Treatment of Ten Cases of Kala-Azar by Sodium Acetyl-para-aminophenyl-stibiate (" Stibenyl ").—** —*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Aug. Vol. 15. No. 10. pp. 44–45.

The use of stibenyl in the treatment of kala azar in India has not been followed by good results (see this *Bulletin*, Vol. 18, p. 240). The author of the paper under review gave the drug another trial. Two sets of Allen and Hanbury's ampoules were used. Six cases were treated with the first batch. Diarrhoea, vomiting and abdominal pain were marked features which supervened, while two of the cases died with collapse within one or two days of the third dose. Four cases were treated with the second batch of ampoules. The drug from these proved less toxic but was ineffective against the disease as in two of the cases, after a full course, parasites were still obtained by spleen puncture, as also in one of the cases which died with high fever and collapse after the ninth dose. In the fourth case the treatment had to be abandoned on account of toxic symptoms, but a cure resulted after a course of intravenous sodium antimonyl tartrate.

C. M. W.

MADRAS. **Annual Report and Statistics of the Government General Hospital, Madras, for the year 1921.** [SYMONS (T. H.), Lieut.-Col., I.M.S., Supt.].—80 pp. 1922. Madras: Printed by the Superintendent, Government Press.

Some observations of interest are taken from the Physicians' Reports. Three cases of kala azar treated with stibenyl are reported by Lt.-Col. ELWES. One died and the other two did not improve till injections of 2 per cent. solution of tartar emetic were substituted. It is concluded from these and two previous cases that stibenyl is useless in the treatment of kala azar. Two cases treated 5–6 years ago with tartar emetic were seen and were apparently free from the infection.

Dr. Guruswami MUDALIYAR avoids the precipitation which occurs on sterilizing tartar emetic solution by autoclaving the salt and water separately and dissolving in the cold. He notes the case of a medical student who was believed in February to have rheumatic fever with relapses. In July he was admitted to hospital and leishmania was grown from his peripheral blood.

A. G. B.

DUNBAR (B. H. V.). **Notes on a Case treated by Intravenous Injections of Tartar Emetic.**—*Jl. Roy. Army. Med. Corps.* 1922. Oct. Vol. 39. No. 4. pp. 298–300.

The case recorded in this paper is of interest in that it is probably one of kala azar which was contracted outside the endemic areas of the disease in India. The patient, age 29, had never been in Assam and had been stationed near Quetta since December, 1921. Before that he had been in Peshawar for three years and had also been in Delhi and Simla. He had all the symptoms of kala azar but owing to his serious condition, spleen puncture was not performed so that no absolute diagnosis was made. His treatment with tartar emetic and his recovery are described, so that there seems to be little doubt that the diagnosis was the correct one.

C. M. W.

DUTTA (A. C.). [**Treatment of Kala-Azar.**] [Correspondence.]—*Indian Med. Gaz.* 1922. July. Vol. 57. No. 7. p. 279.

The writer of this letter states that he has been using sodium antimony tartrate suspended in albolene (2 per cent. and a dose of 1 cc. to commence with) for intramuscular injection in the treatment of kala azar. The cases on which he used it had already been on courses of intravenous injections, so that he is not in a position to state what results would have been obtained if the intramuscular medication had been employed throughout. However, as there was no recurrence of the fever he thinks he is justified in assuming that absorption of the drug had taken place. The important point is that the injections caused no irritation and no symptoms of poisoning or accumulation of the drug were noticed.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part I.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 492–522. With 10 plates.

The writer of this long paper has continued his investigations with the object of discovering some easily administered and non-toxic compound of antimony which can safely be given in the treatment of kala azar. Much of the information is of a highly technical nature which can only be appreciated by an expert chemist. The toxicity of the various compounds which have been prepared has been tested on guinea-pigs and white rats and some of the more promising have been tried on cases of kala azar.

The first part of the paper is devoted to a consideration of the changes produced in the organs of animals which have been given lethal doses of antimony derivatives. The lesions are most marked in the lungs, kidneys, liver, pituitary body and suprarenals. They consist chiefly of haemorrhages into the substance of the organs and destruction of the cells. Of all the antimonyl tartrates, ammonium antimonyl tartrate is the least toxic and it possesses a marked therapeutic value in the treatment of kala azar. On account of its low toxicity and high antimonyl content it is the best of all the antimonyl tartrates mentioned in the paper for the treatment of the disease. Of the aromatic antimony compounds urea stibamine is the least toxic and has been found useful in the treatment of kala azar. Symptoms such as vomiting and purging are much less marked after intravenous injection of an effective dose (·25 gm.) of this drug than after the effective dose (·12 gm.) of tartar emetic or sodium antimonyl tartrate.

C. M. W.

MOLLOW (W.). **Ueber einen Fall von Kala-Azar, behandelt mit "205 Bayer."** [Case of Kala azar treated with "Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 9. pp. 273–282. With 1 chart.

The remarkable action that Bayer 205 has in cases of African trypanosomiasis has naturally led people to wonder if it would have a similar action in other protozoal diseases. MAYER and ZEISS have shown that it is quite inefficacious in cases of Schizotrypanosome infections, as also is tartar emetic, a drug which has such a specific action in kala azar. Mollow has had an opportunity of testing the action of 205 on a case of kala azar in a man who contracted the disease apparently in Macedonia some time prior to September 1920. The disease was naturally thought to be malaria but it was found that there was no response to quinine. The patient's condition became worse, and when the diagnosis of kala azar was made in August 1921 he was in an advanced stage of the disease.

An injection of 0·2 gm. of 205 was given intravenously. This was followed 20 minutes later by a violent rigor and elevation of the temperature to 103·8° F. Two hours later the patient still had fever and a flushed face, while he complained of severe headache. There was epistaxis and bleeding from the swollen gums, bilious vomiting and diarrhoea. The stools were at first slimy but later contained blood and mucus. Consciousness was completely retained and the attack resembled those from which he was suffering previously but was more severe in its intensity. There was some improvement in the condition at night, but violent delirium set in at midnight and the patient died at 4.30 in the morning, 16 hours after the injection.

An autopsy was not performed till the following day, over 24 hours after death. A puncture of the liver and spleen was, however, made soon after death and numerous leishmania were found in the smears. At the post-mortem the liver and spleen were found greatly enlarged, with evidence of thickened capsules and fibrinous peritonitis. The heart was dilated and the muscle showed parenchymatous degeneration. There was fluid in the pericardium. The kidneys revealed parenchymatous and fatty degeneration. Smears from the spleen, liver and bone marrow revealed leishmania only in the latter situation.

The cause of death is discussed at some length and it is pointed out that the post-mortem findings did not help to explain the sudden ending.

C. M. W.

ROW (R.). **On "Reversion of the Flagellate Form of** *Leishmania donovani* **and** *Leishmania tropica* **to the Resistant Non-Flagellate Torpedo and O Body, in Culture Tubes and its Bearing on the Attempts at the Search for the Transmitter.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 476–481. With 1 plate.

The author accepts it as a fact that infection of a vertebrate with leishmania will only result if resistant forms of the organism are present in the material inoculated—forms which occur in the cells in cases of natural infections. Inoculation of cultures to animals only produces infections by reason of the resistant round, oval or torpedo-shaped parasites which are present. He traces the development of these forms from the flagellates in cultures on the surface of the agar in tubes of N.N.N. medium and he argues that the natural mode of transmission will probably depend upon the same resistant forms developed in the intestine of the invertebrate or possibly in some secondary host which acquires its infection from the primary invertebrate host.

C. M. W.

FRANCHINI (G.). **Particularités de culture de certains flagellés. De la culture des Leishmania dans le milieu de Yoshida.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 551–555. With 2 text figs.

In old cultures of the flagellate of *Pyrrhocoris apterus* made in a blood-bouillon medium, it was found that certain aflagellate forms of the organism exhibited amoeboid movements. The same movements were seen in the forms found in a saline emulsion which was made from the completely dried deposit formed at the bottom of a tube which had evaporated about two months before. It is concluded that certain stages which appear in cultures are able to withstand complete desiccation. These amoeboid forms of the flagellates were not seen in cultures of the leptomonas of the dog flea nor in those of *Leishmania donovani*.

The medium of YOSHIDA, which is made by adding about six drops of rabbit's blood to a tube of peptone bouillon, serves for the culture of the parasites of kala azar and oriental sore, the leptomonas of the flea and of *Pyrrhocoris apterus.*

C. M. W.

LEIVA (Lamberto). **The Cultivation of** *Leishmania infantum* **and** *Leptomonas ctenocephali* **on the Triple-N Medium.**—*Philippine Jl. Sci.* 1922. Feb. Vol. 20. No. 2. pp. 179–183.

The object of the investigation described in this paper was to discover the optimum amounts of agar and rabbit's blood which should be employed in making N.N.N. medium for the culture of *Leishmania infantum* and *Leptomonas ctenocephali.* It was found that the best results were obtained with a 2 per cent. agar plus 25 per cent. blood, or a 0·5 per cent. agar plus 5 per cent. blood.

C. M. W.

ADIE (Helen A.). **A Note on Bodies observed in** *Cimex rotundatus,* **Linne, collected in a Kala-Azar infected Area in Assam.**—*Indian Jl. Med. Res.* 1922. July. Vol. 10. No. 1. pp. 236–238. With 1 plate.

This paper gives a description of the bodies found by the author in a bug which had been taken from the bed of a case of suspected kala azar, and prematurely announced to be possible stages of development of leishmania. The same structures have been found in three other bugs. They were met with not only in the salivary glands but also in the intestine and ovaries. The bodies are round or oval and the majority have only a single nucleus but some are stated to have both a macronucleus and a micronucleus. In some there is a clear area which may be a capsule. It was suggested by Mr. HUTCHINSON, who has had considerable experience of microsporidia, that the different staining reactions of the various forms seen may be accounted for by the maturity or otherwise of the parasite, as in the case of Pébrine. No actual measurements of the bodies are given.

C. M. W.

SEMON (H. C.) & CHRISTOPHERSON (J. B.). **Case of Leishmaniasis of the Skin.**—*Proc. Roy. Soc. Med.* (Sect. of Dermat.). 1922. Nov. Vol. 16. No. 1. pp. 8–11. With 2 text figs.

The cases described are of two nursing sisters who contracted Oriental sore on the cheek in Mesopotamia. In one case the sore had apparently healed under treatment by antimony ointment, boric ointment, and X-rays. There remained, however, a small lump, which persisted. Five months later this became larger, while other nodules to the number of 25 appeared around the site of the old sore. No leishmania were to be found in the lesions. The general appearance was that of lupus vulgaris. The second case was of the same nature, and it is concluded that the condition represents a hitherto unrecognized form of dermal leishmaniasis which resembles lupus in its clinical appearance. In the discussion which followed the reading of the paper various opinions were expressed. It was thought that there was no real evidence that the condition then existing was actually one of leishmaniasis, and that it was possibly due to tubercular disease having been grafted on to Oriental sore. [The reviewer in a report on Oriental sore in Bagdad (1911) pointed out that certain cases of the disease resembled lupus.]

C. M. W.

i. Parrot (L.) & Donatien (A.). **Un nouveau cas sporadique de bouton d'Orient sur le littoral algérien.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 410–412.
ii. Pospelow (W. A.). **Beitrag zur Therapie der Leishmania cutanea.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 7. pp. 202–205. With 1 plate.
iii. Fox (Howard). **Two Cases of Oriental Sore (Cutaneous Leishmaniosis).**—*New York Med. Jl. & Med. Record.* 1922. Oct. 4. Vol. 116. No. 7. pp. 365–367. With 2 text figs.

i. The title sufficiently indicates the contents of this paper.

ii. The paper is a record of the author's experiences with seven cases of Oriental sore in people who had returned to Moscow from S.E. Russia. Treatment by the application of CO_2 snow gave the best results.

iii. A record of two cases of Oriental sore in America, the one in a boy who had come from Aleppo and the other in a clergyman from Persia.

C. M. W.

Breda (Achille). **La bouba brasiliana è una leishmaniosi guaribile mediante il tartaro stibiato.**—*Gior. Ital. d. Malattie veneree e d. Pelle.* 1920. Vol. 61. No. 3. pp. 306–310.
Verrotti (G.). **Un nuovo caso (7°) di boubas brasiliano (malattie del Breda) con localizzazione al labbro superiore alla narice destra e al cavo orale.**—*Ibid.* pp. 310–312.

The first of these two papers gives an account of two patients who presented themselves for treatment in Italy after returning from South America, where they had acquired a leishmania infection of the skin and nasal and buccal mucosae. They were cured by injections of tartar emetic.

The second paper describes another similar case.

C. M. W.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

BILLINGHURST (W. B.). **Amoebic Dysentery.**—*China Med. Jl.* 1922 July. Vol. 36. No. 4. pp. 287–297.

Dysentery is, and always has been, the most prevalent of all serious diseases to which the foreigner in Shanghai is liable. It invariably heads the list of admissions to hospital. From analyses made from hospital reports the following statistics are available :—

Period.		Mortality from Dysentery.		Percentage of Liver Abscess to Dysentery Cases.
1870–1880	..	18·47 per cent.	..	16·86 per cent.
1881–1891	..	13·54 ,,	..	—
1891–1900	..	8·6 ,,	..	16·38 ,,
1905–1911	..	5·35 ,,	..	10·56 ,,
1913–1920	..	2·66 ,,	..	2·66 ,,

The regular and marked diminution in the mortality from dysentery and in percentage of cases leading to liver abscess are entirely due to improved methods of treatment, especially directed to the destruction of the *Entamoeba histolytica.* It is therefore concluded that amoebic dysentery is, and always has been, the prevalent form in Shanghai.

The remainder of the paper discusses the familiar lines upon which the different phases of dysentery should be treated: mention is made of acute toxic or fulminating cases, but these are not especially attributed to bacillary infection.

P. H. Manson-Bahr.

SMITS (J. C. J. C.). **Surgical Aspects of Amoebic Colitis.**—Reprinted from the *Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Mar. 29 pp.

Amoebic dysentery may persist, in spite of emetine, E.B.I., and rectal injections of amoebicidal solutions. We have, therefore, been led to consider surgical operations, in regard to which it must be remembered that the infection prevails in the caecum and ascending colon, and that the ulcerative process should be attacked either by appendicostomy or caecostomy. In 1912 the author began to treat refractory cases by appendicostomy and irrigations through the appendix.

After appendicostomy a catheter is introduced, and the colon is flushed viâ the anus, with a litre of tepid soda solution. After this the intestines are rinsed out with a litre of silver nitrate solution and the treatment continued during one or two months. In 12 cases in which the operation was performed the good effects have been permanent in 8 ; in 4 either a relapse or reinfection occurred.

Lavage of the ulcerated gut and necessary rest for the colon are best obtained by caecostomy. What we want is a double opening in the gut with a good spur of mucous membrane between them; this is best obtained by making an artificial anus as follows:—

Under local novocain-adrenalin anaesthesia, the abdomen is opened and the intestine is brought out of the wound in a loop and sutured to the fascia and peritoneum. The mesentery is punctured, a small opening made and a strip of iodoform gauze inserted. The gut after clamping is then opened and two Paul's tubes inserted, one into the afferent, the other into the efferent loop of gut. For six weeks subsequent to operation the bowel is regularly washed out with amoebicidal solutions and the washings examined with regularity to make certain that the parasites are being expelled. A further period of four weeks must elapse after removal of the Paul's tubes before complete healing has taken place. The spur of mucous membrane is removed by Dupuytren's enterotribe. In 16 cases treated in this manner the results were favourable.

Intestinal haemorrhage, which may be rapidly fatal in amoebic dysentery, should be regarded as an indication for operation; in this case a simple caecostomy with a wide opening in the gut should be performed; ligature of the bleeding vessel is obviously impossible, but haemorrhage can be controlled by means of lavage with a solution of permanganate of calcium. The author has now operated six times in such cases; there were four deaths.

P. H. M-B.

REED (Alfred C.). **The Diagnosis and Treatment of Amebic Colitis.**—*Amer. Jl. Med. Sci.* 1922. Oct. Vol. 164. No. 4. (No. 607.) pp. 587–594.

Dysentery can be divided into:—

1. Dysenteries of bacterial origin.
2. Dysenteries associated with definite diseases, such as tuberculosis and syphilis.
3. Dysenteries due to toxic substances, such as mercury and arsenic.
4. Dysenteries due to irritants, such as, in the Orient, chopped pig bristles and bamboo spicules.
5. Dysenteries due to animal parasites; in this group are the dysenteries of kala azar, pernicious malaria, and trematode infections, as well as ciliate and flagellate dysenteries, and finally amoebic dysentery.

Due to its widespread distribution, amoebic dysentery has ceased to qualify as a strictly tropical disease during the last few years. In the United States it has become prevalent in all sections; the factors which are said to have influenced its recent increase are (1) the return of soldiers after the war, (2) increased migration and travel, and (3) the influx of foreign elements into American agricultural and rural districts.

In his treatment of amoebic dysentery, the author does not deviate from the usually accepted standards; he gives, however, together with ipecacuanha in the chronic stage of the disease, an injection of 0·3 gm. neosalvarsan intravenously and an irrigation of a gallon, if possible, of 1 : 2,000 thymol solution at body temperature; he gives also emetine-bismuth-iodide.

P. H. M-B.

BRESSOT (E.). **Les abcès amibiens du foie.**—*Presse Méd.* 1922. Sept. 2. Vol. 30. No. 70. pp. 757–759.

This paper is based upon the author's experience of amoebic abscess in the hospital at Rabat, Morocco. French, Algerians, Spaniards and Moroccans were numbered in this series. In nine instances hepatitis supervened at the close of an attack of dysentery; in five in association with gastro-intestinal disturbance and chronic diarrhoea; in two the patients denied the existence of previous dysentery. *Entamoeba histolytica*, or its cysts, was present in 45 per cent. of cases.

Localized hepatic pain was present in five cases; more usually—in 12 cases—the subjective symptom was a radiating pain in the right shoulder, the special seat being subclavicular, acromio-clavicular or subspinous, according as the abscess was anterior, median, or posterior in position. Enlargement of the liver itself takes place in the first few weeks of the disease, but in the case of small abscesses it is often inappreciable. In large abscesses the intercostal spaces actually were seen to bulge, the hypertrophy of the liver being due more to congestion than to the size of the abscess. A small degree of icterus was observed on five occasions.

The usual diagnostic laboratory tests should be supplemented by radiography. The stretching of the dome of the diaphragm is of special value; normally the right cupola should surpass the left by 2 cm., but in the case of right lobe abscess this figure may attain 6 or even 10 cm. The line of opacity may become irregular and the diaphragm may be immobilized. Exploratory puncture should be made at the point of maximum tenderness, and 10 or even 15 attempts may be made, under ethyl chloride anaesthesia, without danger. In four instances the abscess was found in the left lobe and in 23 in the right. Twenty-three abscesses were single and three multiple.

The author does not believe that emetine therapy is able to abort the progress of amoebic abscess, but that surgical interference should always be insisted upon. In 17 cases the route chosen was the posterior transpleural thoracic, twice the anterior thoracic and seven times the abdominal. In the latter case death is apt to occur from peritonitis; this, however, can be avoided by shutting off the abdominal cavity and withholding lavage till after the third day.

Curettage of the abscess wall is considered a dangerous proceeding and liable to cause haemorrhage. In 11 cases emetine therapy, extending over two months at least, was adopted as an after cure.

The author believes that intravenous injections of novarsenobenzol, four of 0·3 gm. each per month, are efficacious, and that the association of emetine with this drug alleviates the general condition and favours cicatrization. As regards prognosis, a pulse-rate of 100–120 forty-eight hours after the operation should cause anxiety. There were five deaths in this series of 26 cases. Multiple abscesses account for the majority, but the difficulty in making a diagnosis in these cases is recognized.

P. H. M-B.

JELAMBI (R.). **Influencia de la emetina en la disminución de los abscesos hepáticos en Caracas.** [The Influence of Emetine in reducing Hepatic Abscesses in Caracas.]—*Gac. Méd. de Caracas.* 1922. Aug. 31. Vol. 29. No. 16. pp. 193–198.

For the agenda of the Venezuelan Medical Congress in 1921 Dr. Jelambi asked surgeons of note the question: "How many cases of liver abscess have been operated upon by you, and how many have you treated by Rogers's method since 1913 ?" Thirteen sent replies and all spoke very highly of the results obtained by the second method (*i.e.*, aspiration of the pus followed by local injection of emetine hydrochloride).

Statistics are also given from the records of the Vargas Hospital showing the reduction in the number of cases of liver abscess requiring operation before and after the introduction of emetine. From 1907 to 1913 there was an average of 17·7 operations. In 1914 the number was only five, and from that year to 1919 inclusive there have been only 28 altogether [another more detailed table brings the total to 30] and only one in each of the last two years. In 1919 there were nine, but this the author ascribes to the difficulty of obtaining emetine owing to the war. The paper terminates with a eulogy of Sir Leonard ROGERS (who, it is hoped, will recognize himself under the title of "The Wise Man of Calcutta").

H. Harold Scott.

MONGE (Carlos). **Sobre clasificación de las hepatitis inflamatorias con motivo de un caso de hepatitis intersticial amebiana. Comunicación presentada a la "Asociación Peruana para el Progreso de la Ciencia."** [The Classification of Inflammatory Conditions of the Liver suggested by a Case of Interstitial Hepatitis of Amoebic Origin. Communicated to the Association for the Progress of Science in Peru.]—*Crónica Méd.* 1922. Apr. Vol. 39. No. 706. pp. 139–143.

N. N., a male, 32 years of age, had suffered for eight months from diffuse pain in the liver, with marked loss of weight, periodic mucous diarrhoea and fever. Owing to the size of the liver, which occupied the epigastric, right hypochondriac and iliac regions, a diagnosis of liver abscess had been made four months previously, but, when repeated punctures failed to reveal pus, the case was considered as carcinoma of the liver.

When seen again, four months later, the patient had lost 30 lb. in weight, and the pain was very severe. Blood examination gave the following results: Red corpuscles, 2,460,000; leucocytes, 9,000, of which 74·5 per cent. were polymorphonuclears, 8·8 per cent. myelocytes, 8·8 per cent. mononuclears, and 7·9 per cent. lymphocytes. The stools contained amoebic cysts. He was given emetine in one-grain doses. Improvement was rapid; the temperature became normal, pain disappeared, he put on weight, the red cells increased to 3,870,000 in 19 days, and at the end of a month the liver had returned to the normal limits.

The author states that as the spleen enlarges in malaria, so the liver may show a correspondingly great increase in size in amoebic conditions without pus formation, and he therefore suggests that in place of Barker's division of hepatopathies into inflammatory, degenerative, parasitic, neoplastic, and so forth, a better classification would be into:—

1. *Acute hepatitis.*—(*a*) Simple; (*b*) Interstitial; (*c*) Suppurative.
2. *Icterogenic hepatitis.*—(*a*) Spirochaetal; (*b*) Yellow fever; (*c*) Infective bacillary jaundice; (*d*) Yellow atrophy.
3. *Chronic hepatitis.*
4. *Tuberculosis of the liver.*—(*a*) Chronic hyperplastic perihepatitis; (*b*) Cirrhosis.
5. *Syphilis of the liver.*
6. *Toxic hepatitis.*

[Classification of the pathological conditions of the liver is notoriously unsatisfactory, but such a curious arrangement as that suggested can, under no circumstances, be regarded as a " classification," and most men will say that " the old is better."]

H. Harold Scott.

BON (G. J.). **De verschuiving volgens Arneth voor de differentiale diagnose tusschen leverabsces en levergumma.** [The Arneth Index for the Differential Diagnosis between Liver Abscess and Liver Gumma.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 5. pp. 432–438.

Two cases are quoted to prove the considerable value of the Arneth index in doubtful cases. In one the patient was twice operated on for abscess of the liver. Return of the symptoms suggested another relapse, but the shift to the right in the neutrophile leucocytes induced the author to take heed. The Wassermann test was found to be strongly positive and antisyphilitic treatment freed the patient of his complaint.

W. J. Bais.

MAUNSELL (E. C. C.). **A Case of Liver Abscess which had ruptured into the Abdominal Cavity.**—*Indian Med. Gaz.* 1922. Sept. Vol. 57. No. 9. p. 340.

This case presented all the signs of intestinal obstruction ; a definite and painful mass could be palpated with difficulty passing upwards towards the liver. On opening the abdomen general peritonitis and a ruptured right hepatic abscess was discovered ; subsequently a second hepatic abscess was evacuated by aspiration between the sixth and seventh ribs in the anterior axillary line. The patient made a good recovery.

P. H. M-B.

REINHOLD (C. H.). **Traitement moderne des abcès du foie des pays chauds.**—*Bruxelles-Médical.* 1920. Dec. 15. Vol. 1. No. 2. pp. 53–55.

There appear to be no original observations in this paper, though it presents a good clinical description of the disease. The author speaks mainly from experience gained during the war. He states that in Egypt the majority of cases of hepatic abscess in natives hail from districts where a considerable amount of "arak" is consumed, and he wishes to emphasize that the introduction of emetine has removed the treatment of hepatic abscess from the sphere of the surgeon to that of the physician.

P. H. M-B.

ESCOMEL (E.). **Vingt-cinq d'abcès hépatique amibiens guéris par l'émétine, sans intervention chirurgicale.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 537–540.

The author is a great believer in the efficacy of emetine ; he thinks that not only are the entamoebae exterminated by the action of emetine, but that also the red blood corpuscles are in some way altered, so that they are no longer capable of nourishing these organisms when ingested by them.

In cases of hepatitis or hepatic abscess he is of the opinion that, should immediate improvement not result after 2 cgm. of emetine the diagnosis has not been correct. The injections should be made intravenously whenever possible and the patient should remain recumbent for 15 minutes. After the thirtieth injection in a case of hepatic abscess the condition is completely and entirely cured. It is no longer necessary to drain off or aspirate the pus.

P. H. M-B.

IZAR (Guido). **Forme rare di amebiasi latente e cronica. (Nota iii.)** [Rare Forms of Latent and Chronic Amoebiasis.]—*Riforma Med.* 1921. Mar. 26. Vol. 37. No. 13. pp. 292–294.

Observations in Sicily agree with those made by LABBÉ in France in confirming the thesis that the dysentery amoeba is not uncommonly the cause of severe gastro-intestinal disturbances. Owing, however, to the fact that dysentery is considered an acute tropical disease, the diagnosis is often overlooked. In reality, dysentery, like other protozoal diseases, is typically chronic, the acute form being a non-essential episode. Professor Izar describes cases to illustrate the resemblance which chronic dysentery may bear to tuberculous enteritis and appendicitis. When tuberculous enteritis is suspected a careful history of the intestinal disturbances and frequent coprological examinations will assist the differential diagnosis. It must not be forgotten that besides pseudo-appendicitis there may be a true appendicitis resulting from dysenteric ulceration of the appendix.

An acute amoebiasis may result from the administration of a saline purgative to a carrier. It seems that any slight intestinal disturbance may result in the implantation of the amoeba in the intestines of such people who should perhaps be spoken of as the subjects of that latent amoebiasis.

J. Rosslyn Earp.

LAMBRIGHT (George L.). **Hodgkin's Disease following Dysentery: Recovery of Parasites from Stool and Improvement with Antiparasitic Treatment.**—*Jl. Amer. Med. Assoc.* 1922. Sept. 2. Vol. 79. No. 10. pp. 809–810.

Following upon KOFOID's announcement of *E. histolytica* in the lymphatic glands in Hodgkin's disease [see this *Bulletin*, Vol. 19, p. 685], Lambright reports the following case :—

The disease occurred in a man, 30 years of age, with no tubercular history, but with enlarged brawny cervical glands. X-rays demonstrated two large glands at the root of the right lung. In the faeces, the presence of *E. histolytica* and two intestinal flagellates was demonstrated by KOFOID and his associates. On antiamoebic treatment (neoarsphenamin in 0·9 gm. doses intravenously, emetine hypodermically and ipecacuanha in pills by the mouth), he gained 4 lb. in weight in one week and his pyrexia was reduced ; the cervical glands also became reduced in size.

[The evidence afforded is not convincing that antiamoebic treatment exerted any lasting benefit on the glandular enlargement.]

P. H. M-B.

MACGREGOR (A. S. M.) & FREW (J.). **Treatment of Amoebic Dysentery by Alcresta and Emetin.**—*Glasgow Med. Jl.* 1922. Aug. Vol. 98. (N.S. Vol. 16.) No. 2. pp. 114–117.

Alcresta, exhibited alone or as an adjuvant to emetine, was introduced from America a few years ago. Alcresta tablets contain the alkaloids (emetine and cephaelin) from 10 gr. of ipecacuanha held in suspension by hydrated aluminium silicate.

Since April, 1921, fifteen cases have been treated, in eight of which the diagnosis was symptomatic. Alcresta was exhibited in 30-gr. doses per diem together with hypodermic injections of 1 gr. of emetine, a combined course of this kind being equivalent to 20 gr. of emetine—10 orally and 10 hypodermically. After an interval of a week a second similar course of treatment is given, and may be followed by a third. The cases recorded were all examples of old-standing chronic infections, for which treatment had hitherto been of little avail. In only two patients of the series (that is, out of seven in whom the *Entamoeba histolytica* was found at the commencement of treatment) could the results be considered permanently satisfactory.

The improvement which resulted in the other cases appeared to be only temporary.

P. H. M-B.

CAWSTON (F. G.). **Emetine Injections.** [Correspondence.]—*Brit. Med. Jl.* 1922. Oct. 7. p. 661.

The pain commonly resulting from emetine injections can be avoided by using only reliable preparations of the drug, by giving it intramuscularly and by dissolving the tablet in 1 per cent. carbolic immediately before injection. The weak carbolic does not alter the character of the drug and is certainly very gratifying to the patient.

P. H. M-B.

MELLO (Silva). **O tratamento das dysenterias amibianas chronicas pelo Yatren.**—*Brazil Medico.* 1922. July 22. Year 36. Vol. 2. No. 29. pp. 45–49.

An account of the author's experience in the treatment of amoebic dysentery by Yatren, an iodine derivative of benzol-pyridine, containing 30 per cent. of iodine. Clinical histories are given of six cases treated. All had proved entirely refractory to emetine and other treatment, but, in all, Yatren, administered in enemata or by the mouth, brought about cure, the rapidity and completeness of which the author describes as " truly surprising." The dosage was, per os, 1 gm. three times daily; as enema, 10 gm. in 200 cc. of water. Reference is made by the author to an article by MÜHLENS and MENK on Yatren treatment [this *Bulletin,* Vol. 19, p. 31].

F. S. Arnold.

MENK (W.). **Weitere Erfahrungen ueber die Beeinflussung infektiöser Darmkrankheiten durch " Yatren," mit besonderer Berücksichtigung der chronischen Amöbenruhr.**—*Muench. Med. Woch.* 1922. Sept. 1. Vol. 69. No. 35. pp. 1280–1282.

The author has been experimenting with Yatren as an adjunct to emetine and E.B.I. treatment of resistant cases of amoebic dysentery. In three cases Yatren has proved quite successful; but only a thorough course lasting 5–6 weeks should be undertaken, and it should be continued even after the return of the stools to the normal. It is even recommended that treatment should be repeated at six-month intervals and kept up on each occasion for a month. [For details of original Yatren treatment, see this *Bulletin*, Vol. 19, p. 31.]

P. H. M-B.

BEIJNEN (G. J. W. Koolemans). **Calomelbehandeling bij hardnekkige amoebendysenterie.** [Calomel Treatment in Obstinate Amoebic Dysentery.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 4. pp. 408–414.

This is a preliminary communication. It recommends, in cases of failure of the usual treatment, calomel in doses of 0·03 gm. 12 times per day for three days, followed by three days' treatment with bismuth subnitrate (0·5 gm. 12 times). Two cases are quoted, one with very good clinical results, but relapse after three months, the other with complete cure in respect of definite disappearance of the amoebae.

W. J. Bais.

DA COSTA (Aristides Candido) & SILVA. **Sobre um novo tratamento das disenterias amibianas.**—*Rev. Méd. de Angola.* 1921. Nov. No. 2. pp. 213–215. With 3 charts.

The author acted as one of the medical staff of the Loanda Hospital from May to September, 1921. During the earlier part of that period most of the cases of "dysentery" or "diarrhoea" terminated fatally. This the author ascribes to the fact that the hospital was without any emetine hydrochloride. Early in June the author, finding the older traditional treatment (bismuth salts, internal disinfectants, ipecacuanha, etc.) ineffectual, commenced to treat his patients by administering to each three enemata daily, as follows:—

1. One litre of solution of sulphate of soda (2 per cent.).
2. One litre of solution of chloride of calcium (4 per 1,000).
3. One litre of solution of permanganate of potash (1 in 4,000).

The enemata were given warm and the second only after complete evacuation of the first. The results were "brilliant" as compared with what had gone before, but the method was gradually modified, the form finally adopted being thus described:—

Administration by mouth or enema of normal saline solution.

Diet of rice water and *in many cases* milk.

One enema daily of a litre of solution of permanganate of potash with 4 gm. of pure chloride of calcium dissolved in it. This method brought about the cure of the great majority of the cases of dysentery and of all those classed as diarrhoea.

F. S. Arnold.

CAUCHEMEZ (L.). **Présence d'amibes non iodophiles chez des porcs français.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 390–393. With 1 text fig.

The author in the course of last year examined at least 300 "porcine dejections" and frequently found in them an iodamoeba [this *Bulletin*, Vol. 19, p. 25]. He now describes and figures a non-iodophil amoeba which he has observed in pigs' faeces and has localized in the animal's rectum and contiguous part of the colon. He identifies this amoeba with a species discovered in the pig in America by SMITH (*Journ. Med. Res.*, Vol. 23, 1910, p. 423); and observed in faeces of a pig from the Marianne Isls. by PROWAZEK and named by him *Entamoeba polecki* (*Arch. f. Protist.*, Vol. 25, 1912, p. 273); also observed by HARTMANN, who named it *E. suis* (Handbuch der Path. Mikroorg., 2nd Ed., Vol. 7, 1913, p. 607); and in Hamburg pigs by NÖLLER (*Arch. f. Schiffs- u. Trop.-Hyg.*, 1921, No. 2), who remarked on its resemblance to *E. histolytica*, a resemblance to the *minuta* form of which the author also recognizes. No pathological significance is at present to be attributed to this amoeba (*E. polecki*).

A. Alcock.

SCALAS (Luigi). **Contributo allo studio della deviazione del complemento nella dissenteria amebica.** [Complement Deviation in Amoebic Dysentery.]—*Riforma Med.* 1921. Jan. 29. Vol. 37. No. 5. pp. 103–104.

There would be obvious diagnostic advantages in a reliable complement fixation test for dysentery if such could be shown to be practicable. The writer finds that this test is positive in known cases of dysentery, as was found by IZAR (*Ann. di Clin. Med.*, 1914, May 15, Vol. 5, No. 2 & 3), but his method differs from the latter's in that he uses only mucous flakes in the preparation of his antigen instead of using an aqueous extract of unselected faecal matter. Four cases of known diagnosis were examined. In the first two cases of long standing amoebic dysentery the test gave a clearly positive result. The third case tested was a mild case of amoebic dysentery of eight months' duration. It was not found possible to prepare an antigen from the faeces in this case, the antigen prepared in the former cases was therefore used and a positive reaction obtained. By way of control this antigen was replaced by one prepared from mucus passed by a patient with a bacillary dysentery and the reaction was then negative. Finally, negative results were obtained with the serum of the patient suffering from bacillary dysentery and an antigen prepared from Shiga bacilli, also with normal serum and the same antigen, but a positive result with the patient's serum and an antigen prepared from mucus of the patient's stools. This research is to be continued.

J. Rosslyn Earp.

i. IZAR (G.). **La forma clinica cachettizzante dell' amebiasi latente.**—*Riforma Med.* 1921. Jan. 22. Vol. 37. No. 4. pp. 73–75.

ii. CHATTERJI (K. K.). **Surgical Aspects of Amoebiasis.**—*Indian Med. Gaz.* 1922. Sept. Vol. 57. No. 9. pp. 333–337. With 1 plate.

iii. ILOWAISKY (S. A.). [In Russian. Abridged Version in German.] **Zur Kenntniss der Amöben aus dem Leberabszess bei der Dysenterie.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1922. Vol. 1. No. 2. pp. 184–186. With 4 plates.

iv. KITAEFF (F. J.). [In Russian. Abridged Version in German.] **Ein Fall des Amöbengeschwürs der Leber.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1922. Vol. 1. No. 2. p. 184.

i. Two cases of latent amoebiasis with cachectic symptoms are described. In such cases the amoeba subsists in the submucosa of the intestine and possibly in other tissues, causing no acute symptoms, but serious anaemia and general intoxication. Both cases exhibited "hypoadrenal phenomena." The first injection of emetine always provokes a rise of temperature more or less marked and may cause exacerbation of intestinal symptoms.

J. Rosslyn Earp.

ii. Little in this paper calls for comment, except one case in which there was an amoebic abscess in the left lobe of the liver, a second in the spleen, and a third, from which death resulted, in the left lobe of the brain near the optic thalamus.

iii. An account of the morphology of *E. histolytica* illustrated with crude drawings. The author bemoans the absence from current literature since the days of LOESCH of any accurate description of this organism.

iv. An unrecognized liver abscess burst into the peritoneum, causing general peritonitis, in the pus of which numerous entamoebae were discovered. Death ensued. This is the first case recorded in Saratov.

P. H. M-B.

BACILLARY DYSENTERY.

NICOLLE (Charles) & CONSEIL (E.). **Vaccinations préventives par voie digestive chez l'homme dans la dysenterie bacillaire et la fièvre méditerranéenne.**—*Ann. Inst. Pasteur.* 1922. Aug. Vol. 36. No. 8. pp. 579–613. With 4 charts.

Though according all credit to BESREDKA for his work on immunization *per os*, the authors have been led to criticize his work in some particulars.

The toxicity of cultures of Shiga's bacillus has, so far, militated against the general adoption of prophylactic inoculation against bacillary dysentery ; this is due to the special endotoxin of B. Shiga and the clinical symptoms of the disease are but an expression of this same necrotic action upon the mucosa of the intestine.

Intramuscular inoculation of 250 million Shiga bacilli heated to 75° C. produces no immediate reaction ; on the fourth day, however, oedema and painful infiltration of the site takes place, with malaise, etc., and the reaction, which much resembles that of antityphoid inoculation, but is more severe, does not pass away till 11 days after, so that the method cannot be used compulsorily in the army. A second inoculation 8–15 days later of 750 million organisms gives a similar violent reaction. It happened in 1915 that a severe epidemic of dysentery, proved by CHATTON to be bacillary in origin, had occurred in French troops occupying Southern Tunisia. In order to guard against the recurrence of a similar epidemic in the autumn of 1916, it was decided to institute antidysenteric inoculation on a voluntary basis ; two intramuscular inoculations were given at eight-day intervals, the first of 250, the second of 750 millions, but owing to enemy activity at that time the complete programme could not be carried out ; nevertheless, 1,018 men received one injection. The effects were similar to those already described. Sick leave had, on this account, to be given, and the majority of the aviators were unable to leave Tunis on the appointed day. The ultimate results of this experiment could not be ascertained with accuracy ; the non-recurrence of the epidemic was ascribed to sterilization of the water.

Intravenous injection of dysentery bacilli has been practised intermittently since 1912—using living cultures, by preference attenuated strains. This method has definite advantages, as it approximates most closely to the natural processes of the disease. Four preliminary experiments were made with freshly isolated cultures, 20–75 millions of organisms being injected at a single dose. As a general rule, pretty violent reactions ensue, but the authors conclude that even large doses of living organisms injected intravenously are incapable of reproducing dysentery in man ; the reaction is too acute to render the method suitable for universal adoption, and has nothing to do with the viability of the bacillus, since it occurs also with dead cultures. Ingestion of ox-bile tablets, it would appear, is useful in mitigating the reaction.

When one comes to the ingestion of dysentery organisms by the mouth with a view to producing immunity, one is met with the difficulty of reproducing bacillary dysentery by these means. Two causes militate against success ; firstly, the rapid attenuation of the cultures and, secondly, the natural resistance to infection exhibited by the native Tunisian. The majority of pathogenic organisms become virulent only when certain conditions are fulfilled.

In five Europeans (three French and two Russians) the authors obtained five positive results, but in 12 natives only one ; this is probably due to a gradual process of immunization since childhood. The rectal route, in natives at any rate, proved the least uncertain. Certain strains of dysentery bacilli are more virulent than others ; three of the Europeans were successfully infected with strains subcultured over two years. They failed to infect a subject after a dose of 500,000 million organisms (combined oral and rectal route) and succeeded with 25 millions (oral route alone).

In the case of natives, 24-hour cultures, killed by heat at 72–75° C. for one hour, were employed for oral vaccination ; sometimes also concentrated extracts of Shiga's bacillus submitted by BESREDKA. The subjects for experimentation were prepared dietetically for some time previously.

Their limited experience would lead them to believe that in Europeans a certain amount of protection is afforded by the oral method of inoculation. A virulent culture, isolated three weeks previously, was employed. Two non-inoculated subjects absorbed on four occasions 100,000 million of organisms killed by heat (one hour at 72° C.)—in all, 400 milliards. One case contracted bacillary dysentery 15, the other 18, days after ingestion ; the two controls, previously subjected to immunization *per os*, exhibited no disturbance of any sort when subjected to the same treatment, and their sera agglutinated the organism in a strength of 1 : 10 and 1 : 20 respectively.

This experience has convinced the authors that one can immunize against dysentery via the digestive route, and also against undulant fever [see this *Bulletin*, Vol. 19, p. 742], so that one can scarcely doubt that this method will prove equally efficacious in typhoid and cholera.

P. H. M-B.

LINS (Abdon). **Sobre os agentes da dysenteria bacillar.**—*Brazil Medico.* 1922. Aug. 19. Year 36. Vol. 2. No. 33. p. 101.

This note is based on systematic experiments to determine the causal agent of the dysentery syndrome in Rio de Janeiro, the material examined (50 specimens of faeces) being obtained from notified cases of dysentery. The following germs presenting specific characteristics were identified from pure cultures :—

1. *B dysenteriae* Shiga (Case No 7).
2. *B. dysenteriae* Flexner (Cases Nos. 13 and 14).
3. *B. pseudodysentericus* Morgan (Case No. 3).

In addition to these known types seven were isolated differing in character from those already recognized.

P. H. M-B.

AOKI (Kaoru). **[Ueber die agglutinatorische Einteilung von Dysenteriebazillen.]**—*Tohoku Jl. of Experim. Med.* 1921. Sept. Vol. 2. p. 142. [Summarized in *Bull. Inst. Pasteur.* 1922. Aug. 15. Vol. 20. No. 15. p. 599.]

The author does not place any reliance on fermentation tests as a means of differentiating dysentery bacilli. Of 43 strains investigated four belonged to the Shiga type ; but all the remainder were " pseudo-dysentery " organisms. After cross-agglutination tests had been performed with sera made from each strain, he managed to distinguish eight groups.

P. H. M-B.

BERGELL (Peter) & BONNIN (Leo). **Ueber Ruhr bazillenträger.**—*Deut. Med. Woch.* 1922. Aug. 18. Vol. 48. No. 33. pp. 1098–1100.

Five cases of chronic bacillary dysentery were intensively studied and completely cured by injection of autogenous vaccine. The cases were all due to the Shiga-Kruse bacillus, though in two the serum co-agglutinated Flexner's bacillus as well. Initial doses were small, gradually augmented and given at daily intervals in the ascending scale of 5, 10, 20, 30, 40, 50, 60 millions. The injections were made subcutaneously deep under the skin of the back.

In three cases only after large doses of 40–60 million a reaction set in ; this manifested itself in a rise of temperature, accompanied by malaise and subsequently by the disappearance of the specific bacilli from the stools.

In the cases in whom a co-agglutination to Flexner was also present no reaction was noted till a dose of 180 millions had been reached, when the " Flexner-phenomenon " disappeared. Sharp reactions were noted between 180 and 200 millions.

P. H. M-B.

HUDSON (N. Paul). **A Case of Persistent Infection with** *B. dysenteriae* **(Flexner).**—*Jl. Amer. Med. Assoc.* 1922. Nov. 11. Vol. 79. No. 20. pp. 1676–1677.

Both the true carrier of bacillary dysentery and the type of person who is really a chronic case of the disease have been incriminated as spreading dysentery, especially in military organizations. The rarity of the true carrier has led to the view that the convalescent is the dangerous factor in the spread of the disease. The case to which attention is drawn is of special interest because of the relatively few instances of persistent Flexner infections reported in America.

The patient, a student, contracted dysentery in June, 1918 ; since that time he has been subject to intermittent attacks of diarrhoea. In January, 1922, the Flexner-type of dysentery bacillus was isolated from a faecal motion ; the organism was agglutinated in a dilution of 1 : 80 by the patient's serum, five months after the last attack of diarrhoea ; it was also agglutinated to half the titre of specific anti-Flexner serum.

It is suggested that possibly a relation existed between the organism isolated and the appearance of " clay-stools " the patient passed in 1919.

P. H. M-B.

GORDON (Jehoasch). **Beitrag zur spezifischen und medikamentösen Therapie der akuten bazillären Ruhr.**—*Reprinted from Ztschr. f. Krankenpflege.* 1921. July–Sept. Vol. 43. No. 7–9. 26 pp. With 1 chart in text.

A real development of serum therapy in bacillary dysentery took place during the World War. A comprehensive survey is here given, commencing with attempts to produce bactericidal sera (ROSENTHAL, CONRADI, TODD, KRAUS and DÖRR); later developments were directed towards the preparation of antitoxic sera (KOLLE and others).

Since the introduction of serum therapy the death-rate has greatly decreased. SHIGA in 1903 reduced it from 22 to 7 per cent., ROSENTHAL from 17·5 to 4·5; KRAUS (1912) from 19·2 to 9·65. As regards the dosage the optimum amount has progressively increased with more extensive experience. SHIGA recommended 10–100 cc.; RUFFER and WILLMORE, 100–320 cc. in serious cases; SCHITTENHELM, 220 cc. The object is to neutralize the toxins circulating in the blood and to kill off, if possible, the organisms in the intestinal mucosa. The consensus of opinion on the German side during the war is that good results were obtained.

SCHITTENHELM gives the following figures for 1916:—

	Dysentery. Cases.	Deaths.	Percentages.
(1) For Field Ambulance—			
Number of Cases treated without serum	541	25	4·6
Number of Cases treated with serum	3,219	43	1·3
(2) For Base Hospital—			
Number of Cases treated without serum	570	11	2·0
Number of Cases treated with serum	434	2	0·5

Other observers give the following figures: BEYER, 3·75 per cent. death-rate; MEYER, 5·8, and SCHARF, 1·96. Of course, in severe clinical cases it is greater.

The action of the serum on the intestinal symptoms seems to be pronounced; both objective and subjective symptoms immediately improve. SCHITTENHELM gives other statistics showing that of serum-treated cases 92 per cent. were cured in four weeks, with less favourable results in cases treated by medicinal means. The majority are in favour of the intramuscular and subcutaneous route rather than the intravenous.

A review is given of vaccine therapy combined or not with serum from authors whose papers have been adequately noticed in this *Bulletin*. There is also a dissertation upon the general medicinal management of a case which calls for little comment.

[This paper, as a whole, constitutes a very fair literary review of the subject, but contains little, if any, original matter.]

P. H. M-B.

DE BIEHLER (Mathilde). **Sérothérapie dans la dysenterie infantile.** —*Arch. Méd. des Enfants.* 1922. Aug. Vol. 25. No. 8. pp. 464–477.

Encouraged by the results of serum therapy in dysentery, the author began to treat children in this manner in 1915. At first she was disposed to postpone serum therapy till the case had been diagnosed bacteriologically, but once convinced of its efficacy she has employed it in every case diagnosed on clinical grounds. One hundred and twenty nine cases passing sanguino-mucous stools were for the most part benign, but there were 21 grave cases, three of which were *in extremis* when first seen. The serious cases presented the familiar phenomena of incessant diarrhoea (20–60 stools a day), strangury and rectal prolapse. As regards complications, there was one case of noma, seven of nephritis and four of pyelitis. The injection of serum was unaccompanied by any accidents; sometimes a scarlatiniform eruption ensued at the site of injection on the trunk or limbs, or on the abdomen. The absence of reaction is attributed to the administration of calcium chloride. Usually 20 cc. were injected; 60 or even 80 cc. were given in grave cases. The serum was a polyvalent one. Three deaths were recorded in the 129 cases. Two when first seen were *in extremis*; the third was a case of noma. A notable improvement was generally observed 24 hours after injection; in 36 the child was happy and laughing; 78 were boys and 51 girls; in age they ranged from 4 months to 19 years, the majority between 4 and 8 years.

In conclusion, she is of the opinion that serum therapy should not be neglected; it is a remedy of first-rate importance.

P. H. M-B.

MATSUO (Iwao) & IZAWA (Tamekichi). **A Contribution to the Classification of the Dysentery Bacillus.**—*Acta Scholae Med. Univ. Imperialis in Kioto.* 1922. Vol. 4. No. 4. pp. 571–581.

Classification of dysentery bacilli based upon sugar reactions alone has long been recognized. Some investigators lay chief stress upon agglutination, but most are agreed that on account of group agglutination it is difficult to distinguish the Y from the Flexner type. It is possible to change the Y type into the Flexner type and a type (C type, Basugi) which, like *Bacillus coli communis*, is capable of splitting lactose. From 25 days to 3 months is required to produce this new character and culture in an unsuitable medium. The Y type of dysentery bacillus was isolated fresh from faeces and cultured in an inorganic medium which contained 1 per cent. of maltose, lactose, saccharose and dextrin respectively. After 25–90 days any strain of Y type was able to ferment maltose and lactose; some were able to ferment saccharose and dextrin, others not. From the serological and immunological point of view the new Y type was identical with the original strain, but morphologically it changed, becoming more slender and less active in Brownian movement. From the classification point of view the fact that, judged on sugar reactions alone, the Y type could be changed into a Flexner type and a lactose-fermenter must be taken into consideration.

P. H. M-B.

BREINL (Friedrich). **Variationserscheinungen in der Dysenteriegruppe.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1922. Vol. 35. No. 1–2. pp. 176–190.

These researches have been undertaken with three toxic and four atoxic strains of dysentery bacilli. Two of the toxic strains, when grown for a considerable period in broth, produced variants. The variant colonies can be distinguished at sight: in one case, that of the type, they are clear and transparent; in the other, that of the variant, they are of a yellow colour, opaque and granular. However, these grosser characters appear to be evanescent and not to express themselves in antigenic differences. Some colonies showed a tendency to spontaneous agglutination, but this property also does not appear to persist.

This variability even affects the morphology of the organisms. The individual bacilli of the original culture are large thread-like rods; those of the variant, small, oval and plump. The sugar reaction, typical of Shiga's bacillus, remained unaffected and they are agglutinated to a greater or smaller extent by the specific Shiga serum of a titre 1 : 5,000. Of the 16 cultures tested out in this manner half behaved as a typical Shiga-Kruse bacillus should, while the other half, being spontaneously agglutinable, was not affected by the different serum concentration. Absorption tests were undertaken to ascertain whether the auto-agglutinability was in any way connected with variation in antigenic properties, and it was found that five strains had undergone such profound changes that the receptive mechanism in complement deviation had become altered.

The effect of homologous sera prepared from rabbits demonstrated that this was so; an immune serum prepared with one variant failed to bind complement in the presence of the heterologous antigen, when one of these specially prepared rabbit sera was used as an amboceptor. The differentiation of the variants one from another was still further brought out by these experiments.

The atoxic cultures investigated in the same manner produced also a number of variants.

The author believes that this work sheds great light upon the occurrence of spontaneous outbreaks of bacillary dysentery in war-time—that atypical and even gas-forming organisms, may become, under certain circumstances, transformed into true dysentery bacilli.

[This is a long technical and somewhat involved dissertation, with numerous tables, to which it is difficult to do justice in a summary. It should be consulted, therefore, in the original.]

P. H. M-B.

SZYMANOWSKI (Z.) & SZERESZEWSKI (L.). [In Polish and German.] **Przyczynek do zmienności bakteryj czerwonkowych. Beitrag zur Variabilität der Ruhrbacillen.**—*Przegl. Epidemjol.* Warsaw. 1922. Vol. 2. No. 2. pp. 201–222. (German summary pp. 222–223).

During the summer of 1920, strains of organisms were cultured from typical cases of dysentery which were agglutinated neither by Shiga nor by Flexner antisera and, being non-toxic for rabbits, were thought to be in close affinity to the bacillus of Schmitz. It was a remarkable fact that the 12 strains isolated were, after subculture for 2–3 weeks, agglutinated by a "Strong" serum. Unexpected results were obtained by observing the variability exhibited by four strains over a period of eighteen months. The organisms were educated to ferment mannite and maltose without and with gas formation; when they reached this stage they were agglutinated by paratyphosus B and C sera.

P. H. M-B.

ROBERTSON (R. Cecil). **The Toxins of** *B. dysenteriae* **Shiga.**—*Brit. Med. Jl.* 1922. Oct. 21. pp. 729–730.

The author has confirmed in the main the observations of OLITSKY and KLIGLER upon the toxins of *B. dysenteriae* (Shiga) [see this *Bulletin,* Vol. 16, p. 18], but it has been found impossible to produce endotoxin without concomitance of a considerable quantity of the neurotoxin, or exotoxin. Although two definite toxins for animals may be produced by Shiga bacilli, yet there is considerable evidence that the neurotoxin or endotoxin has a secondary action on the intestine through the initial inhibition of peristalsis. The oral administration of living Shiga bacilli to rabbits does not produce either dysentery or any demonstrable serological reaction in the blood; the toxicity of dried Shiga bacilli is not affected by treatment with acetone or the subjection to 100° C. for twenty minutes. The various means of producing detoxication depends upon the maceration of the bacillus with a strong alkali, subsequent neutralization and precipitation. Detoxication affords a means whereby active immunization of animals may be produced; the intradermal reaction is not severe and large subcutaneous doses may be given without severe disturbance.

P. H. M-B.

KANAI (S.). **Further Experimental Studies on Immunization against *B. dysenteriae* (Shiga) and its Toxins.**—*Brit. Jl. Experim. Path.* 1922. June. Vol. 3. No. 3. pp. 158–172.

The main object of the author's experiment, to determine the degree of local immunity in the intestinal mucosa produced by the ingestion of dysentery bacilli, was not achieved.

No strain of *B. dysenteriae* (Shiga) was found which, when inoculated into rabbits, gave rise to intestinal lesions to the exclusion of other pathological changes, and, secondly, all attempts to separate endotoxin from exotoxin proved useless. It is only necessary to suspend an agar culture in normal saline and to remove the bacilli by centrifugation to obtain a highly toxic fluid. This soluble fraction produces only the same lesions as the whole bacilli, and when heated for one hour at 80° C. all toxicity was lost.

The toxin of Shiga's bacillus affects in rabbits principally the central nervous system and at the same time produces congestion and haemorrhage in the various viscera. Exposure for one hour to the temperature of 80° C. much reduces its toxicity, especially for the central nervous system. Though there is some indication that oral immunization produces a local immunity in the intestinal wall, this point remains undecided. The oral administration gives rise to a less general reaction than does inoculation subcutaneously. The antibody titre of the serum of rabbits immunized *per os* is appreciably raised by repeated ingestions. Attempts to secure a solid active immunity against the potent soluble toxin of *B. dysenteriae*, when intravenously administered, have not been attended with such striking success as when active immunity has been procured by live bacilli similarly administered.

P. H. M-B.

DAVIES (Arthur). **An Investigation into the Serological Properties of Dysentery Stools.**—*Lancet.* 1922. Nov. 11. pp. 1009–1012.

The object of this investigation was to ascertain whether the intestinal exudate in bacillary dysentery stools would contain specific antibodies to specific dysentery bacilli. In the cases earliest obtained both blood serum and intestinal exudate were examined for agglutinins, which were found to be absent from the former, but present in the latter. So far as could be ascertained the stools were derived from cases in the first week of their illness.

The stools were treated in different ways: either the fluid portion was pipetted off, or the blood and mucus were well shaken up with a small quantity of normal saline.

The technique adopted to ascertain the presence and titre of agglutinins was that devised by GARROW. The titre of *B. dysenteriae* Shiga agglutinins was not a high one and varied from 1/10 to 1/80. No agglutinins to B. Flexner were found, nor were these organisms isolated. Investigations were undertaken on these lines to ascertain whether other organisms played a part in the pathology of dysentery, and it was decided to test the agglutinability of non-lactose gas-producing organisms which seemed to suggest that they also may be etiological agents.

In the chronic stage of the disease it was found that the specific agglutinins could be obtained from pledgets of mucus passed by the bacillary, but not from the amoebic cases.

P. H. M-B.

SHIMOJO (Kumaichi). **[On a New Biological Phenomenon that Typhoid and Dysentery Group of Bacilli takes on the Specific Culture Medium.]**—*Eiseigaku Densenbyogaku Zasshi* (*Jl. of Hyg. & Infect. Dis.*). 1922. Apr. Vol. 17. No. 4. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 271.]

Shimojo, noticing that a turbidity occurs round colonies of these bacilli on agar medium, proved this to be due to acid formation. The medium prepared for their identification consists of glycerin, cholates and litmus agar, and the only species producing reddening are *B. paratyphosus* A, *B. dysenteriae* Shiga and, of course, *B. typhosus.* Thus the medium would differentiate *paratyphosus* A from B, and B. Shiga from other types of dysentery bacilli.

P. H. M-B.

DUMAS (J.) & COMBIESCO (D.). **L'intoxication dysentérique du Cobaye.** —*C. R. Soc. Biol.* 1922. Oct. 21. Vol. 87. No. 30. pp. 942–943.

The guinea-pig is not very sensitive to intravenous or subcutaneous injections with Shiga's bacillus; very exceptionally, lesions typical of bacillary dysentery lead to death.

As a rule, intravenous injection of $\frac{1}{10}$th cc. of Shiga culture causes death in 24 hours. In this series only one out of four animals succumbed. At autopsy the stomach and intestines were congested, the liver degenerated, the kidneys and suprarenals engorged. The organism was recovered from the brain, liver, spleen, kidneys, bile, urine and intestinal contents.

Subcutaneous inoculation of the same dose produced intestinal lesions more resembling the human pathology. Forty-eight hours after the subcutaneous or intravenous inoculations are made, the mucosa of the large gut is most affected.

P. H. M-B.

BAIL (Oskar). **Elementarbakteriophagen des Shigabazillus.**—*Wien. Klin. Woch.* 1922. Aug. 31, Sept. 21 & 28. Vol. 35. Nos. 35, 36–37, 38–39. pp. 722–724; 743–746; 765–768.

The phenomenon of bacterial autolysis is no new one. It has long been known that bacteria undergo this change in artificial culture, one of the best examples of this being the spontaneous clearing which takes place in broth cultures of the pneumococcus. We also know from the work of MALFITANO, EIJKMAN, and others, that certain organisms (*e.g.*, *B. pyocyaneus, B. anthracis*) secrete bacteriolytic enzymes, and that others, again, produce auto- and hetero-growth-inhibiting substances. The work of TWORT and D'HERELLE has presented this problem in a somewhat different light, though there is little reason for supposing any fundamental difference between the phenomenon described by them and auto-bacteriolysis as we already knew it. In 1915 TWORT isolated a micrococcus from vaccinia which, when grown on agar, showed a " glassy " or translucent change which commenced at the edge of the colonies. He showed that this " glassy " change could be transmitted to healthy colonies, that it was produced by an agent which passed through filters, and that it increased at the expense of the micrococci which it attacked.

This observation of TWORT's passed almost unnoticed, and it was not until D'HERELLE's communication on the Bacteriophage appeared (1917) that the interest of scientific investigators was arrested. D'HERELLE found that the filtrates of stools from dysenteric convalescents contained a lytic agent for Shiga's bacillus, and he showed that this lytic principle could be propagated in series. From this and other observations (effect of temperature and antiseptics on the lytic agent) D'HERELLE concluded that the phenomenon of bacteriolysis with which he was dealing was brought about by a living ultramicroscopic virus—a bacterial parasite—to which he gave the name *bacteriophage*. It has since been shown that this lytic principle or " bacteriophage " is present in many forms of organic matter (intestinal contents of man and animals, pus, peritoneal exudates, tissue juices, etc.) and that its action is not specific, a given lytic principle exerting its action on a more or less wide range of bacterial species, the members of the coli-typhoid-dysentery group being the most generally susceptible.

Although the facts, as originally observed by D'HERELLE, have been amply confirmed by other investigators, his explanation of the phenomenon has not met with general acceptance. BORDET and CUICA are of the opinion that the lytic principle originates from the bacteria themselves produced in response to some external stimulus (leucocytic exudate), and that the bacterial destruction liberates a further supply of lytic principle. KABESHIMA thinks that the lytic agent is an unorganized ferment whose origin he does not specify. LISBONNE and CARRIÈRE are of the opinion that the lytic enzyme is produced by intestinal bacteria as a result of bacterial antagonism. The majority of workers, however (GRATIA, BRUYNOGHE, WEINBERG and ANZAR, McLEOD, LEDINGHAM, FLEMING, ELLIS, KUTTNER), incline to the view that this phenomenon is one of bacterial autolysis, which can be initiated by a variety of primary stimuli, the bacterial destruction liberating a further supply of enzyme capable of carrying on the process.

Until comparatively recently, this appeared to be the only alternative to the bacteriophage theory of D'HERELLE. Bail, however, has supplied us with a still further hypothesis. This author thinks that the filter-passing lytic principle consists of minute corpuscles which are the product of the bacterial destruction. According to Bail these corpuscles—which he names " Splitter "—represent portions of the original bacterial cell, capable themselves of secreting enzymes. In his most recent papers on this subject he supports and elaborates his original conception. He supposes that these corpuscles or " Splitter " represent portions of the hereditary (chromatin) apparatus of the bacterial cell and that the enzyme secreted by them performs some essential function in bacterial multiplication. All this is highly speculative and will require very substantial proof before it can be accepted.

S. Phillips Bedson.

HAUDUROY (P.). **De l'action du sérum antidysentérique sur la lyse du bacille de Shiga par le bactériophage de d'Herelle.**—*C. R. Soc. Biol.* 1922. Oct. 28. Vol. 87. No. 31. pp. 966–967.

If in each of a series of, say, 20 tubes each containing an equal amount of a young culture of Shiga bacillus a drop of antidysenteric bacteriophage be placed (an amount sufficient to effect lysis), and then there be added Pasteur Institute antidysenteric serum in a gradually increasing dose throughout the series, beginning with two drops in the first tube and ending with 40 drops in the twentieth tube, lysis will take place at intervals varying from half-an-hour to eight hours in all the tubes, except the last three, which have received respectively 36, 38 and 40 drops of the serum. This holds good whether the serum be fresh or old and whether it came from the same horse or not, and for any strain of Shiga bacillus, and for any strain of antidysenteric bacteriophage. In other words, antidysenteric serum inhibits the action of d'Herelle's bacteriophage.

Since the filtrate taken from any tube before lysis has occurred contains the bacteriophage intact, we must infer that the inhibitory action of the serum is exercised not on the bacteriophage but on the Shiga bacillus. We may suppose that something is secreted by the bacillus that intervenes in the d'Herelle phenomenon ; that this " something " is fixed by the antidysenteric serum, so that lysis is stopped or retarded, and that as the bacilli multiply more of this " something " is produced, and lysis starts again. If, however, an excess of the serum has been added—as in the tubes that received 36, 38 and 40 drops—lysis is inhibited for an indefinite time.

P. H. M-B.

ONGKIEHONG (H. F.). **Pathogene darmbacteriën en lage temperaturen.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* 1922. Aug. 5. Vol. 7. No. 4. pp. 244–253. [English and French summaries pp. 253–254.]

From a study of the influence of low temperatures on dysentery bacilli of various types, the author found the atoxic types more resistant to low temperatures than the more toxic ones. At −20° C. in the freezing tank, about −190° C. in liquid air, and −253° C. in liquid hydrogen, some toxic strains died, while some atoxic strains survived −190° C. and −253° C. for several days.

The colon bacillus and the typhoid-paratyphoid group are more resistant to low temperatures; they were not killed after exposure to −20° C. for 30 days, at −190° C. in liquid air, and at −253° C. for three days in liquid hydrogen.

P. H. M-B.

CHARBONNEL (M.). **Abcès osseux colibacillaire postdysentérique.**—*Rev. de Chirurg.* 1922. Year 41. No. 5. pp. 345–358. With 2 figs. in text.

A purely technical and surgical discussion on the best method of treatment for bone abscesses occurring after dysentery. In this case two abscesses were situated in the shaft of the tibia.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

ANDERSON (J. S.). **Dysentery in the West Indies.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Sept. Vol. 15. No. 11. pp. 53–56.

Figures culled from the published vital statistics show that dysentery accounts for about 5 per cent. and intestinal diseases 20 per cent. of the total deaths in the West Indies. The facilities for laboratory diagnosis in this part of the Empire are extremely limited, and, with the possible exception of the capital towns, there is no centre for microscopic examinations. The three main types of dysentery are found there—the bacillary, the protozoal and the helminthic (*Schistosoma mansoni*), though the question of diagnosis is practically limited to the two first named.

Complications of amoebiasis, commonly seen in the East, are singularly rare in the West Indies; in nine months Anderson saw only one case of perforating amoebic ulcer and two cases of liver abscess.

British Guiana has almost unique difficulties in sanitation. The inhabited portion of the colony lies on an average 4 ft. below the high-water level. In Georgetown small septic tanks have been installed in most of the public buildings, but the greater part of the city is most insanitary; dysentery therefore is afforded every chance to spread.

The treatment of dysentery in the West Indies leaves much to be desired. Most of the native drugs employed are astringents, but there is one prepared from the fruit of *Aldinia insignis* which was found to consist almost entirely of pure starch. As a general rule, acute cases are treated with hypodermic injections of emetine and saline aperients; if no improvement results after two such injections, bacillary dysentery is diagnosed, though antidysenteric serum is not utilized or appreciated at all.

P. H. M-B.

JAUSION (H.). **Les dysenteries à Fez de mai à décembre 1921.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 377–386. With 1 chart in text.

It is necessary to distinguish autochthonous cases of dysentery from those imported by troops or civilians visiting the Colony. In the first category are placed amoebic and bacillary dysentery, enteritis caused by Lamblia, Trichomonas, spirochaetes, and by various helminths. Important helminths are the ankylostome, schistosome and *Hymenolepis nana.*

Amoebic dysentery was diagnosed 231 times by the active and 39 times by the cystic forms. Both were present in the stools of a single case. The number of cases began to increase towards the end of summer and reached its maximum in December. Two proved fatal, one from numerous perforations. In 184 cases, bacillary dysentery was recognized by the characteristic exudate in the stools. Conditions militate against the successful isolation of the specific bacilli for the reason that in military practice cases are not admitted to hospital till the fourth or fifth day of their illness.

From the blood of two extremely serious cases *Bacillus paratyphosus* B was isolated. *Giardia intestinalis* was found on 65 occasions ; save in one or two exceptions, this parasite appeared in association with other forms of dysentery. Spirochaetes and fusiform bacilli were present in 20 examinations. Ascaris ova were found 44 times and those of trichocephalus 31 times. Ankylostomiasis, classified here as a dysentery, appears to have been imported recently into Morocco by labourers from the Cameroons. *Taenia saginata,* Oxyuris, Hymenolepis, Blastocystis, and even a mite—*Tiroglyphus siro*—are held responsible for causing dysenteries.

P. H. M-B.

DUMONT (J.). **Dysenteries amoebo-spirillaires et dysenteries spirillaires.** —*Paris Méd.* 1922. Aug. 12. Vol. 12. No. 32. pp. 161-164.

The spirochaetes found in association with or as a result of longstanding amoebic infection are certainly not *Sp. vincenti,* but are spiral organisms. Films must be stained by the Fontana-Tribondeau method in order to demonstrate them adequately. In preparations thus made the organisms are 7-8 μ in length; longitudinal division has never been observed. The organism, the author thinks, is similar to that previously described by LE DANTEC. It is peculiar to the intestinal mucus and is not found in the saliva or vaginal mucus. Emetine has no effect on these cases, but, according to the author, even two intravenous injections of 0·3 gm. of neosalvarsan are followed by almost instantaneous improvement. The organism is found in very small numbers in the mucus of the normal colon, but it appears to multiply excessively only in certain cases of amoebic dysentery and probably is the cause of the obstinacy of these cases.

P. H. M-B.

CHELMONSKI (A.). **Le traitement de la dysenterie.**—*Gaz. des. Hôpit.* 1922. Sept. 12 & 14. Vol. 95. No. 71. pp. 1143.
——. **Die Behandlung der Ruhr.**—*Ztschr. f. physikalische u. diätetische Therap.* 1922. Vol. 26. No. 9. pp. 346-347.

Without any attempt at differentiation on an etiological basis, this physician believes that he can cure any case of dysentery, however desperate, by what he terms the antiphlogistic method. Exactly what he means by this is not clear ; apparently it consists of clearing out the bowel and placing the patient on a starvation diet, consisting mostly of albuminous substances. An initial dose of calomel or castor-oil should be given and sweetened tea should be the only source of nourishment; the remainder of the treatment is mainly dietetic (black coffee, cocoa, cheese, grilled meat and, during convalescence, finely chopped hard-boiled eggs).

He also appears to subject his patients to a cold "sitzbad" daily for 20 to 30 minutes and maybe, under certain circumstances, to ice-poultices to the abdomen.

P. H. M-B.

MELNOTTE. **Un cas de dysenterie balantidienne.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 374–376.

The rarity of this form of dysentery in North Africa prompted the publication of this paper. The patient, who was not acutely ill, was passing diarrhoeic stools with blood and mucus flecks, alkaline in reaction and numbering 6–8 per diem. Besides the balantidia, ova of ascaris and trichocephalus were numerous; the organisms themselves were typical and contained ingested red blood corpuscles. The patient was cured with thymol and salicylic acid, 1 per cent. lavage, followed by santonin and calomel as a vermifuge.

The author concludes that the symptoms were attributable to the balantidia and not to the coexistent helminthic infection, and that the salicylic acid played a favourable part in the treatment.

P. H. M-B

CHRISTELLER (Erwin). **Ueber die Balantidienruhr bei den Schimpansen des Berliner Zoologischen Gartens.**—*Virchows Arch. f. path. Anat. u. Physiologie.* 1922. Aug. Vol. 238. No. 3. pp. 396–422. With 24 text figs.

A female chimpanzee in the Berlin Zoo, notorious as having given birth to a well-formed baby in captivity, commenced dysenteric symptoms in August, 1921; in the faeces, numbers of active balantidia were seen, but the dysentery bacilli were not detected. At autopsy the intestinal mucosa was injected, swollen and beflecked with small ecchymoses, occurring especially on the mucous folds; but the balantidia could not be demonstrated either in the gut wall or in its contents, for which the partial decomposition of the tissues is held responsible. Shortly afterwards a second animal died after a brief acute illness and again balantidia were found in the stools. The pathologo-anatomical picture was similar, that is a haemorrhagic inflammation with minute follicular swellings. In this case a preliminary formalin injection of the cadaver had been made and therefore the tissues were perfectly preserved.

In sections, numerous balantidia were present in the acini of Lieberkühn's glands and around them very considerable leucocytic infiltrations had taken place, with a considerable proportion of eosinophiles. The organisms do not usually penetrate the muscularis, and only once were nests of individuals encountered in the submucosa. They appear to congregate especially in the solitary lymphoid follicles and to ingest polymorphonuclear corpuscles and red blood cells. They are undoubtedly responsible for the pathological condition and may even phagocytose large numbers of bacteria. The organisms were found nowhere else in the body, though the mesenteric glands were large and infiltrated.

[This paper is illustrated with some excellent microphotographs]

P. H. M-B.

ASCOLI (Alberto). **Contributo alla conoscenza della dissenteria da Shiga-Kruse.**—*Boll. d. Istituto Sieroterapico Milanese.* 1917. Mar. Vol. 1. No. 1. pp. 21–46. [Received Oct. 16, 1922.]

COLOMBO (F.). **Vaccinazione contro la Dissenteria bacillare.**—*Boll. d. Istituto Sieroterapico Milanese.* 1920. Dec. No. 6. pp. 397–399. [Received Oct. 16, 1922.]

CÓRDOBA (Salvador). **Comentarios acerca del tratamiento quirurgico de las disenterias agudas graves.**—*Gac. Méd. de Caracas.* 1921. Nov. 15. Vol. 28. No. 21. pp. 324–328.

GAEHLINGER (H.). **Les entérites chroniques parasitaires et leur traitement.**—*Bruxelles-Méd.* 1922. July. 2e année. No. 17. pp. 427–432.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

MESNIL (F.). **Sur la nature des spirochètes.**—Reprinted from *La Médecine.* 1921. Sept. 4 pp.

The writer of this paper gives an interesting summary of recent work on the group of organisms known as spirochaetes. EHRENBERG created the two genera *Spirochaeta* and *Spirillum*, the former including flexible and the latter rigid organisms. He regarded them as animals belonging to the family of the Vibrios. Forty years later the discovery of the spirochaete of relapsing fever was made, and after another 20 years a similar form in the blood of geese was described. VINCENT discovered spirochaetes in the disease now known as Vincent's angina, and SCHAUDINN and HOFFMANN found them in syphilis. Later still, spirochaetes in infectious jaundice, rat-bite fever, yellow fever and "Mediterranean dengue" were described.

Though EHRENBERG regarded both the spirochaetes and spirilla as animal organisms, later observers grouped them with the bacteria, till SCHAUDINN claimed to have proved that the spirochaetes were stages in the evolution of certain protozoa. Even before this the large spiral organism which occurs in oysters and possesses a membrane was considered by CERTES to be related to the trypanosomes. Working in conjunction with LAVERAN, the author showed that such a view was incorrect and that the parasites of the oyster were in no way related to these flagellates. At the present time all observers are agreed that the spirochaetes have nothing in common with the flagellate protozoa. There is no organized nucleus and the body consists of a series of chambers, in the walls of which chromatin occurs. In the smallest forms little or no structure can be made out. Multiplication is by transverse and not longitudinal division. The only character which separates the spirochaetes from the bacteria is the flexibility of the body. To the author it seems in many cases impossible to classify lowly organisms as definitely animal or vegetable, and he reflects that as nature has not made these hard and fast demarcations it may be futile for us to attempt to do so.

As regards the spirochaetes themselves there seems to be little doubt that the large crested organism of the oyster occupies a place apart and can be legitimately placed in a separate genus, *Cristispira.* For the other forms EHRENBERG's *Spirochaeta plicatilis* is the type, and from the researches of ZUELZER it is known to consist of an axial filament round which is wound the spiral cytoplasmic body. The question is raised as to whether the other spirochaetes are similarly constituted. SCHAUDINN created the genus *Treponema* for the spirochaete of syphilis chiefly because of the presence of a terminal filament, while SWELLENGREBEL and SAMBON almost simultaneously suggested the names *Borrelia* and *Spiroschaudinnia* for those of relapsing fever. NOGUCHI created the genus *Leptospira* for the organism of infectious jaundice. It was noted that the axial filament characteristic of the genus *Spirochaeta* was not apparent in these forms, and the genera were separated on the varying rigidity of the spirals and the degree of their development. Japanese workers, however, have shown that such an organism, which occurs in the blood of fowls, studied in the blood itself and in cultures varies considerably in these respects, so that it is impossible to consider them as essentially different from the spirochaete of syphilis. The author remarks that he has searched in vain for any character which affords a reliable means for separating these genera. ZUELZER's recent work appears to show that there is no object in retaining them. According to her the spirochaete of infectious jaundice actually has an axial filament, and she thinks it is probable that other pathogenic forms have also. We are thus brought back to the single genus *Spirochaeta* for all these forms, a result which will lead to a very desirable simplification of the nomenclature. Without any generic significance the words treponema and leptospira may, however, still be employed for the sake of convenience.

The organism of rat-bite fever, which is perfectly rigid and has one or more flagella at each end, cannot be regarded as a spirochaete. It is a pathogenic spirillum. There appear, however, to be forms which occupy a position intermediate between the spirochaetes and spirilla. DUBOSCQ and LEBAILLY have shown that certain spiral organisms which were discovered in the stomach cells of cats and dogs by BIZZOZERO have terminal flagella but flexible bodies. For these forms they establish the genus *Spirella,* which occupies an intermediate position between the genera *Spirillum* and *Spirochaeta.*

ZUELZER has demonstrated that in water there occur a series of spiral organisms which correspond morphologically with all those which have been shown to be pathogenic for man and animals—observations which open up a rich field for investigation.

C. M. Wenyon.

HOFFMANN (W. H.). **La inmunidad en las enfermedades espiroquéticas.** [Immunity in Spirochaetal Diseases.]—Reprinted from *San. y Benefic. Bol. Ofic.* 1922. Jan. & Feb. Vol. 27. Nos. 1 & 2. pp. 3–24.

——. **Die Immunitätserscheinungen bei den tropischen Spirochaetenkrankheiten.**—Reprinted from *4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Batavia. 42 pp.

Under the head of *Recurrent Fever* the most important points noted are, first, the rôle played by the spleen. Animals which, under ordinary conditions, recover, die if splenectomy has been first performed, and, further, animals normally insusceptible, such as grey rats, to *Sp. duttoni,* become susceptible after this operation. Secondly, the immunity resulting from an untreated attack of the disease is much stronger than that produced after cure by injection of salvarsan ; in fact, in the latter there may be no immunity produced at all. Treatment by injection of the serum of a patient who has passed through an attack 2–10 weeks previously has as good results as those with salvarsan and does not interfere with the production of active immunity.

Prophylactic injection of defibrinated blood (1 to 20 cc.) from recovered patients gives definite protection for a brief period only—not more than a week.

Fowl Spirochaetosis.—The blood of an animal which has passed through an attack protects others for a period of 3–4 weeks. In the case of this organism extirpation of the spleen does not have the deleterious effects mentioned under recurrent fever. Hereditary transmission of immunity occurs in this form only of the spirochaetoses.

In *Syphilis* antibodies are never produced in sufficient amount to bring about spontaneous cure. Under the most favourable circumstances there is established merely an equilibrium between the spirochaetes and the defensive forces, which may break down at any moment. Also, cure of the disease does not result in the production of immunity, since such a person is then as susceptible to a fresh attack as a healthy man.

Mention is made of the treatment of syphilis of the nervous system by intrathecal injection of salvarsanized serum, the beneficial effects being due, the author thinks, in part at least to antibodies formed in the serum, while failure of natural cure or even amelioration of such conditions is due to anatomical causes, the antibodies in the blood being unable to reach the cerebrospinal fluid in sufficient quantities.

In the case of *Weil's Disease* an attack confers immunity which, so far as is known, may persist for years. The serum, either that of a convalescent or that obtained from horses artificially immunized, being spirochaeticidal and lytic, and not antitoxic, must be given before the fifth day and before there is any jaundice if it is to be of any service. Mention is made of the employment of serum for prophylaxis and also of vaccines. The latter protect for three months or more and should be polyvalent, as the strains of leptospira differ in different places.

The permanent immunity resulting from an attack of *Yellow Fever* and the use of antiserums and vaccines are spoken of. In experimental work with guinea-pigs a definite leucocytic reaction is noticed and in severe cases is a favourable sign. In man, however, it does not occur in this disease, though it has been noticed in infectious jaundice.

" Rabbit syphilis," disseminated sclerosis, ulcus tropicum, ulcerative stomatitis, bronchial spirochaetosis, spirochaetal dysentery, rat-bite fever, and seven-day fever, all receive brief mention, but, from the point of view of immunity, no new facts are educed.

H. Harold Scott.

ST. JOHN (J. Harold) & BATES (Lewis B.). **The Relapsing Fever Spirochete of Panama. Evidence to show that it is a Distinct Species.**—*Amer. Jl. Trop. Med.* 1922. May. Vol. 2. No. 3. pp. 251–266.

The authors have conducted a series of experiments with the relapsing fever spirochaete of Panama and have compared its serological reactions with those of other relapsing fever spirochaetes. The serum of monkeys and rats which had recovered from infections and had been rendered hyperimmune by further injections of the organisms was tested on the various strains as regards its agglutinating and spirochaetocidal action *in vitro* and its power of conferring immunity *in vivo*.

Several strains of the Panama virus were used, and it was found that the sera of animals which had been rendered immune to these strains agglutinated and killed the various strains and protected against infection, a result which tended to show that the several strains were the same. The serum of the Panama strains, on the other hand, did not affect other strains such as *S. obermeieri*, *S. novyi*, *S. kochi* and *S. duttoni*. Moreover, these strains resembled one another more closely than they did the Panama strain, from which they differed in a striking manner. It results from these investigations, which are illustrated by a number of tables which form the bulk of the paper, that the Panama relapsing fever spirochaete differs from the others against which it was tested, and that there is some justification for regarding the spirochaete as a distinct " species, variety or strain."

C. M. W.

BATES (Lewis B.) & ST. JOHN (J. Harold). **Suggestion of *Spirochaeta neotropicalis* as Name for Spirochaete of Relapsing Fever found in Panama.** [Correspondence.]—*Jl. Amer. Med. Assoc.* 1922. Aug. 12. Vol. 79. No. 7. pp. 575–576.

As the neotropical region includes Central and South America, the name *Spirochaeta neotropicalis* is proposed for the relapsing fever spirochaete of Panama, which may be identical with that producing relapsing fever in Colombia and Venezuela.

C. M. W.

DARLING (Samuel T.). **The Rat as a Disseminator of the Relapsing Fever of Panama.**—*Jl. Amer. Med. Assoc.* 1922. Sept. 2. Vol. 79. No. 10. pp. 810–812.

The work of BATES, DUNN and ST. JOHN [this *Bulletin*, Vol. 19, p. 320] on the transmission of relapsing fever of Panama by the tick, *Ornithodorus talaje*, raises the question of the possibility of rats playing a part in the spread of the disease. The writer has noted that the house rat, *Mus rattus*, is frequently found infested with the nymphs of this tick, and as rats are susceptible to inoculation it is not improbable that the spirochaetes may be transmitted from the rat to man by the ticks. Rats undoubtedly play a part in the dispersal of the ticks and presumably also of the infective agent of relapsing fever in Panama.

C. M. W.

BRIGGS (LeRoy H.). **Relapsing Fever in California.**—*Jl. Amer. Med. Assoc.* 1922. Sept. 16. Vol. 79. No. 12. pp. 941–944. With 4 text figs.

Though cases of relapsing fever of extraneous origin had previously been noted in the United States, the first outbreak which could be ascribed to an endemic focus was that recorded by MEADER (1915) from Bear Creek Canyon, Colorado, in which five related cases occurred. Two years later WARING recorded an isolated case also from Colorado. In the present paper the author reports the occurrence of relapsing fever in a man and his wife who contracted the disease while camping in California. How the infection was acquired is not known, but as species of Ornithodorus occur in the locality it is probable that these ticks are the vectors.

C. M. W.

KERREST (J.), GAMBIER (A.) & BOURON (A.). **La fièvre récurrente au Soudan.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 320–331. With 1 map in text.

Up to the beginning of 1921 relapsing fever was unknown in the French Sudan, but the disease appears to have been introduced by native soldiers returning from active service abroad, who were assembled at Kati on the Niger before distribution to their homes. The authors trace the spread of the disease to the towns and villages on the river. The vector appeared to be the louse.

The disease was of a severe type, and in a large number of cases was associated with enlargement and tenderness of the liver, and jaundice. There was violent headache, and diarrhoea was common.

Vomiting, except in Europeans, was a rare symptom. Albuminuria constantly occurred, but was only marked and persistent in a few cases. Haemorrhage in the form of epistaxis was a common feature, and its severity bore a definite relation to the intensity of the jaundice. As regards the mortality, in one series of 48 cases there were eight deaths, and in another of 120, which were only diagnosed clinically, there were 14 deaths. It is remarked that the disease is a serious one, and that a differential diagnosis from Weil's disease may be difficult to make unless the spirochaete is found in the blood.

C. M. W.

SERGENT (Edm.) & FOLEY (H.). **L'épidémiologie de la fièvre récurrente dans l'Afrique du Nord.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 170–187. With 5 figs. & 1 chart.

Having read the paper by CRAGG on relapsing fever in the United Provinces of India, [this *Bulletin,* Vol. 19, p. 555] the authors describe the conditions which prevail in a district in North Africa and show that the factors which govern outbreaks of the disease are not the same as in the district investigated by CRAGG.

The climate at Beni-Ounif de Figuig, a military post on the Morocco-Algerian border of the Sahara, is extremely hot and dry in summer and cool but still relatively dry in winter. Outbreaks of relapsing fever were studied here in 1907 and 1914, and they attained their greatest intensity in the months March to June. The hottest season is in July. After this the disease disappears almost completely in the period August to October, to commence again with the rains and cool weather in November.

Relapsing fever amongst this isolated population is thus a cool weather disease. Age, sex and nationality have no influence on its incidence. When it comes to the question of the explanation of the epidemics which occur from time to time the authors cannot agree with CRAGG that this is to be found in exceptional climatic conditions which influence the development of the louse. They believe that during an epidemic the bulk of the population acquire an immunity which is not of permanent duration, and that as this immunity is gradually lost with time the population again becomes liable to reinfection. This occurs directly cases of the disease are introduced, probably by the nomad Arabs transporting infected lice.

As regards typhus fever, which occurs in epidemic form from time to time like relapsing fever, it appears in November and reaches its intensity during the period March to May. Both diseases, however, occur sporadically throughout the year. Typhus fever outbreaks follow periods of depression and poverty of the population.

An account is given of the experimental work which has been conducted in Algeria since 1907 in connexion with the louse transmission of relapsing fever. This is fairly well known and serves to establish the fact that lice are the actual vectors, and that the spirochaetes ingested by the lice, after an unexplained temporary disappearance, reappear in the tissues of the lice in large numbers from the sixth day onwards.

C. M. W.

CRAGG (F. W.). **Relapsing Fever in the United Provinces of Agra and Oudh.**—*Indian Jl. Med. Res.* 1922. July. Vol. 10. No. 1. pp. 78–189. With 17 charts, 5 maps & 1 text fig.

This paper is an amplification of one reviewed in this *Bulletin* (Vol. 19, p. 555). It is mainly of epidemiological interest and the arguments in favour of the existence of relapsing fever in the United Provinces and its seasonal incidence are supported by a number of charts and curves constructed from figures in the official reports. The epidemics which have occurred from time to time reach their height in the three hottest and driest months of the year, a season which is generally supposed to be least favourable to the louse. Relapsing fever does not occur, as in other countries, during the cold season, whereas typhus fever in India is true to type and is only found in the colder districts.

During epidemics the death-rate for the ages 20 to 40 increased to a figure which varies from two to nearly three times the mean death-rate for the previous five years, while it becomes evident that relapsing fever in the United Provinces kills more males than females. The disease, moreover, is not one which is confined to the poorest and most ill-housed of the population, but one to which practically all the inhabitants are liable, irrespective of their caste or habitat. There is little doubt that infestation with lice is the normal condition among the bulk of the population, and is by no means confined to the lower castes or very poor. The disease remains in endemic form and, owing to climatic circumstances, which were explained in the previous review (*loc. cit.*), every now and then breaks out in epidemic form.

A certain number of experiments with lice were made with a view to establishing their method of transmitting the disease and confirming the work of French observers. Though these were far from complete they appeared to indicate that the development undergone by the spirochaete in the louse in India was similar to that described in North Africa.

It results from the facts brought forward in this paper that it should be possible to foretell an epidemic. The peculiar climatic conditions in the shape of exceptionally low temperatures in April and May, which only prevail in the year preceding an epidemic, and any increase in the autumn-death rate of males not attributable to cholera or other major diseases are probably indications that an outbreak of relapsing fever in epidemic form will follow.

C. M. W.

STAROBYNSKY (A.). **La fièvre récurrente persane (Miana).**—*Presse Méd.* 1922. Aug. 30. Vol. 30. No. 69. pp. 1445–1446.

The writer states that so long ago as 1844 a Russian traveller in Persia recorded the existence of a disease in Miana which was caused by "white bugs." There was intense fever, often terminating fatally. A complete description of the disease was given by DJOUNKOWSKY in 1912 [see this *Bulletin*, Vol. 1, p. 624]. It was common amongst the Russian troops who advanced into Persia in this year. Similarly in the last war the troops were again infected. The writer observed a number of cases. The first attack of fever, which occurred about five days after exposure to ticks, frequently lasted only one day. The number of relapses varied from three to nine. Generally speaking, the illness was less severe than the European type of relapsing fever, though its duration was usually longer and sometimes extended through two or three months.

The tick which is regarded as responsible for the disease is *Ornithodorus tholozani* or, as some would have it, *Ornithodorus miana.*

In the author's opinion the Miana disease closely resembles the tick fever of Africa, and since near Batoum, on the Black Sea, there is a negro colony, he thinks it possible that the African disease was imported and has found a footing owing to the presence of *Ornithodorus tholozani.*

C. M. W.

KLIGLER (I. J.). **The Cultivation of** *Spironema duttoni* **from a Case of Relapsing Fever.**—*Brit. Jl. Experim. Path.* 1922. Aug. Vol. 3. No. 4. pp. 215–216.

In Vol. 19, p. 323, of this *Bulletin,* an account was given of a medium in which Kligler and ROBERTSON successfully cultivated the spirochaete of relapsing fever. In this case the cultures were obtained from experimental animals. The author of the present paper states that he has obtained a culture on this medium from a human case, and has been able to maintain it by subculture and to infect rats by means of the cultural forms. He is led to record this observation as the only record he can find of the successful culture from the human blood is by PLOTZ [this *Bulletin,* Vol. 10, p. 270].

C. M. W.

BJEKOLOFF (P.) & SCHUHALTER (W.). **Beitrag zur Züchtung der Rückfallfieber-spirochäte und einige Bemerkungen ueber die Immunität bei Rückfallfieber.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 9. pp. 265–269.

The authors have succeeded in cultivating the relapsing fever spirochaete in a medium which is a slightly modified form of that recommended by ARISTOWSKY. It is prepared as follows :—

The white of a hard-boiled egg is cut into pieces from 1–2 cm. in length, several of which are placed in each test tube. After adding to each tube 8 cc. of physiological saline solution the tubes are autoclaved at 115–120°C. for 15 minutes. When cool, to each is added either 4 cc. of fresh uninactivated horse serum, or better, 2·5 cc. of inactivated rabbit serum. The medium is inoculated with 1–5 drops of the patient's blood. Incubated at 28°–30° there is a maximum growth at the end of 4–6 days. Subculture is effected by transferring with a pipette about a drop of the culture to a fresh tube.

Though ARISTOWSKY was successful in maintaining a culture for two months, during which 19 subcultures were made, the authors have only succeeded in carrying the culture through 4 subcultures. As regards the possibility of obtaining cultures, the strains of spirochaetes from different patients vary considerably.

C. M. W.

MARZINOWSKY (E. I.). **Ueber die Entwicklung der** *Spirochaeta recurrentis* **im Organismus des Menschen.** [The Development of *S. recurrentis* in Man.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 8. pp. 231–237. With 1 fig.

From a study of the behaviour of spirochaetes in the blood of relapsing fever cases the author believes he has found an explanation of the relapses. During the course of the first attack with the development of antibodies in the blood, some of the spirochaetes are destroyed while others become rolled up into forms which are said to be analogous to cysts. It is stated that salvarsan has a much feebler action at the end than at the beginning of an attack owing to the presence of these resistant forms. The destruction of the spirochaetes in the body is largely due to phagocytosis. Within the phagocytes the spirochaetes are quickly destroyed, whereas the encysted forms are able to resist the digestive powers of the cells. During the apyrexic period the development of the encysted forms takes place till finally spirochaetes are again formed and these, escaping from the leucocytes, lead to the relapse. [It is evidently incorrect to apply the term cyst to these forms, and the evidence that they are actually able to give rise to spirochaetes again and that the series traced is not one of progressive degeneration instead of reconstruction appears unconvincing.]

C. M. W.

ZELLER (Heinrich). **Neosalvarsandosis und Milchzuckerinjektionen bei Rückfallfieber.**—*Muench. Med. Woch.* 1922. July 28. Vol. 69. No. 30. p. 1121.

The author has investigated the action of intravenous injections of solutions of lactose in relapsing fever. If 5–10 cc. of a boiled 10 per cent. solution are given, a severe rigor occurs in 1–2 hours. This is followed in about 12 hours by a crisis associated with profuse sweating. In most cases, however, the temperature rises again in a short time. It is found that the injection causes an agglutination of the spirochaetes in the blood. In some cases, however, there is no subsequent rise of temperature till ten days later, when a relapse would be expected. If a small dose of neosalvarsan (0·1–0·2 gm.) is administered after the 10 cc. of the sugar solution the same phenomena are noted, a rigor followed by a fall in the temperature, which again rises to its original height. After a further interval of 20–40 hours the temperature again falls and this time remains down, there being no recurrence. Combined with solutions of lactose, small doses of neosalvarsan thus bring about a cure which only larger doses of neosalvarsan alone are able to effect.

C. M. W.

PODIAPOLSKY (P.). [In Russian. Abridged Version in German.] **Zwei Worte ueber den Rückfalltyphus und den Flecktyphus. Ein historisches Notabene zum Moment.** [A Historical Note on Relapsing Fever and Typhus.]—*Rev. Microbiol. et Epidemiol.* Saratov. 1922. Vol. 1. No. 2. pp. 181–183.

This note has been written to call attention to the long forgotten work of Professor Gregor MÜNCH (in Russian, MINCH) on relapsing fever. Immediately after the appearance of OBERMEYER's account of the occurrence of spirilla in this disease in 1873, experiments were undertaken by MÜNCH, who not only saw the organisms in cases of relapsing fever in Odessa, but actually infected himself by inoculation of blood and definitely recognized that the disease could be distinguished from typhus by the presence of the parasites in the blood. MÜNCH gave an account of his experiments in the *Moskowsky Wratschebny Westnik* (Moscow Medical News), 1874, No. 1, Sept. 9.

C. M. W.

FAUST (Ernest Carroll). **Bronchospirochetosis in China.**—*Arch. Intern. Med.* 1922. Sept. 15. Vol. 30. No. 3. pp. 343-354. With 1 fig. & 3 charts.

The author of this paper has undertaken the study of bronchial spirochaetosis in China, a country in which little attention appears to have been paid to this condition. A systematic investigation of cases suffering from haemoptysis in the Wuchang hospital has revealed the fact that the percentage of cases with spirochaetal infection of the bronchi is decidedly high. It is admitted that a large proportion prove to be primary cases of tuberculosis, pneumonia, gangrene, empyema, moniliasis, paragonimiasis or rhinitis, but in a certain number it is stated that the spirochaete is the primary agent.

The primary cases may be acute, sub-acute or chronic. In the acute the disease is initiated by chill and fever and lasts from two to eight days. The expectoration is scanty and mucopurulent and seldom contains traces of blood. While arsenicals produce relief, the clinical symptoms may disappear without treatment. In the sub-acute type the general symptoms are similar but there may be haemoptysis and bronchitis with slight crepitations. The chronic cases are insidious in onset and there is chronic cough. The sputum is mucopurulent, often blood-streaked, while in many instances there is considerable haemoptysis. There may be moist or dry râles or consolidated areas. In many cases there is a daily rise of temperature. In most cases rest and treatment with Fowler's solution, cacodylates, arsphenamine or neoarsphenamine bring about rapid recovery and apparent cure. In acute cases arsenicals injected intravenously give immediate relief, but cure is not effected till after a second and perhaps third dose. In the chronic cases, arsenicals are definitely specific and relatively rapid in their spirochaeticidal properties. This fact appears to meet Dr. MANSON-BAHR's objection, cited from his book, that the causal relationship of the spirochaete to the condition has not been proved.

C. M. W.

MOUCHET (R.) & VAN NITSEN (R.). **La bronchite spirillaire dans les camps de travailleurs noirs au Katanga.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Vol. 2. No. 1. pp. 115-120. With 3 charts.

Cases of bronchitis associated with blood-stained expectorations are more common in Katanga than has hitherto been supposed. Spirochaetes are present in the sputum but associated with them are usually found numerous bacteria including pneumococci, staphylococci, streptococci and several other varieties. Amongst the natives the condition often leads to bronchopneumonia and pneumonia. As treatment the authors have employed tartar emetic, stibenyl, ioglysol (a colloidal preparation of iodine and glycogene) and neosalvarsan. Though the first three drugs appear to influence the condition favourably, none of them has any action whatever on the spirochaetes, which persist as long as expectoration continues.

C. M. W.

DE MELLO (Froilano) & DE ANDRADE (Mario). **Spirochétose broncho-pulmonaire au Nord de Portugal.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 284-286.

The paper records the occurrence of bronchial spirochaetosis in North Portugal. The morphology of the spirochaetes is described and compared with that of the forms which occur in the mouth. The suggestion is made that these various spirochaetes may be distinguished by an index which is obtained by dividing the sum of the lengths of a hundred organisms by the total number of turns they possess. In this way a figure is found for the average length of each spiral. In *S. buccalis* the index was 2 and in *S. dentium* 1·5, while in *S. bronchialis* it varied from 1·63 in one case to 1·18 in another.

It is stated that the bronchial spirochaete is extremely polymorphic, and the fact that the index of the spirochaetes varied in the two cases between 1·63 and 1·18 rather suggests that the index is of little diagnostic value.

C. M. W.

BLANCHARD (M.) & LEFROU (G.). **Présence de spirochètes dans le sang d'européens atteints de fièvre bilieuse hémoglobinurique. Le problème étiologique de cette spirochétose.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 699–722.

—— & ——. **Sur un spirochète trouvé dans le sang de cas de fièvre bilieuse hémoglobinurique, et son section pathogène.**—*C.R. Acad. Sci.* 1922. Oct. 9. Vol. 179. No. 15. pp. 602–604.

By a process of repeated centrifugation of the blood of two cases of blackwater fever the authors have isolated a spirochaete which is inoculable to guinea-pigs. Structurally the organism appears to resemble a leptospira though the description of the morphology is not very clear.

There seems to be no doubt that the two cases, which were both in Europeans, were such that a diagnosis of blackwater fever was justified. One terminated fatally; the other recovered. The method by which the spirochaetes were obtained was as follows:—

From the vein 10 cc. of blood was extracted and this was placed in a centrifuge tube containing 1 cc. of sterile 10 per cent. citrate of soda solution. The mixture was centrifuged for about 10 minutes at 1,500 revolutions per minute. The supernatant fluid was removed to another tube by means of a pipette and again centrifuged for a similar period. The fluid was again transferred to another tube and centrifuged a third time till a whitish deposit had formed. In this deposit the spirochaetes described in the paper were found. They were discovered in both the cases investigated.

Some of the deposit was inoculated into a guinea-pig, which became infected with the spirochaete. The strain was passed through a series of ten animals, after which it ceased to be infective. At first the virus appeared to increase in virulence, for at the third passage the animals developed haematuria, which is the chief characteristic of the infection, as well as congestion of the organs and haemorrhagic extravasations. Jaundice, which is such a notable feature of infection with leptospira of Weil's disease and yellow fever in guinea-pigs, was not noted. Attempts to obtain a culture of the organism were not successful. In one case a guinea-pig was inoculated intraperitoneally with virus from another animal and at the same time with 1 cc. of the patient's serum subcutaneously. The animal died on the 11th day from some unknown cause. It had not acquired the spirochaetal infection so that it appeared that the serum had protected it against infection. Two control animals which did not receive the serum acquired a fatal infection.

The question of the relationship of the spirochaete is discussed. The authors conclude that blackwater fever is not due to one cause but that it is a symptom of several diseases. The organism discovered by them is regarded as being the etiological factor in one of the types of haemoglobinuric fever. They lay great stress on the occurrence of haematuria in the guinea-pigs and explain the absence of haemoglobinuria as the direct outcome of the high alkalinity of the urine of the rodents as compared with that of man. Reference is made to SCHUFFNER's discovery (this *Bulletin*, Vol. 13, p. 300) of spirochaetes in the blood of a case of infectious jaundice associated with haemoglobinuria in Sumatra. This observer considered he was dealing with a new disease and named his organism *Spirochaeta biliohaemoglobinuriae*. Blanchard and Lefrou accept this name for the organism which they describe.

The paper contains a table in which the various spirochaetal diseases of man, their chief symptoms and the character of the associated spirochaetes are clearly detailed. Reference is here made to a spirochaete found in an infectious jaundice of the Congo. This disease is said to have been transmitted from guinea-pig to guinea-pig by means of bed bugs even 38 days after a feed on an infected animal. This disease appears to be the same as that referred to by these authors and LAIGRET in the paper reviewed in this number of the *Bulletin*.

The experiments recorded in this paper appear to have been carefully carried out, but it is evident that further investigations on the lines indicated are required. The fact that a second spirochaetal disease is described and that this as well as Weil's disease occurs in the Belgian Congo where the two cases of blackwater fever were investigated shows that spirochaetal infections of this type are more common than has been expected. It is to be noted that no account is given of any attempts to discover similar organisms in healthy persons or those suffering from other diseases by the methods described in the paper, so that the two isolated observations on blackwater fever cases lack adequate control.

C. M. W.

LEGER (Marcel) & BÉDIER (E.). **Passage du** *Spirochaeta crocidurae* **à travers le placenta.**—*C.R. Soc. Biol.* 1922. Oct. 21. Vol. 87. No. 30. pp. 949–950.

It was shown by Leger (1917) that the rodent *Crocidura stampflii* is not infrequently found naturally infected with a spirochaete which resembles the relapsing fever spirochaetes of man. It is inoculable to rats and in these animals the authors have maintained the strain. They now note that this organism, which they named *Spirochaeta crocidurae*, is able to pass from the mother to the foetus. One of the rodents which was killed in gestation was found infected and in the heart blood of five foetuses the spirochaetes were found in larger numbers than in the blood of the mother. It was shown by BREINL and KINGHORN (1906) that *Spirochaeta duttoni* was able to pass the placenta in experimentally infected rats, while NATTAN-LARRIER (1911) showed that though spirochaetes were often apparently absent from the foetal blood their presence could be demonstrated by inoculating the blood to rats.

C. M. W.

SANGIORGI (Giuseppe). **Le spirochetosi dei muridi. Nota 2a (Proposta del sottogenere " Treponemella ").**—*Pathologica.* 1922. Aug. 1. Vol. 14. No. 329. pp. 461–463. With 1 text fig.

Having discovered in the heart blood of a mouse a small spirochaete with terminal flagella, the author again discusses the various spirochaetes which have been found in rats and mice (see this *Bulletin,* Vol. 19, p. 558). He now introduces a new name, *Treponemella,* for certain forms, one of which is the *Spirochaeta laverani* of BREINL and KINGHORN, while he places in the genus *Spironema* the *Spirochaeta muris* of WENYON. As pointed out in the previous review, these spirochaetes are identical, as they were described from the same material which the reviewer studied in Paris. MESNIL in a paper reviewed in this number, notes that these small organisms are probably not spirochaetes at all, but spirilla.

C. M. W.

CASTELLI (Giorgio). **Dei ceppo recidivi nella infezione sperimentale da** *Spironema recurrentis.*—*Boll.d. Istituto Sieroterapico Milanese.* 1917. Nov. Vol. 1. No. 2. pp. 57--74. [Received Oct. 16, 1922.]

INFECTIOUS JAUNDICE

MANSON-BAHR (Philip). **A Case of Weil's Disease Occurring in London. With an Account of a Laboratory Examination of the Case by** WENYON (C. M.) & BROWN (H. C.).—*Lancet.* 1922. Nov. 18. pp. 1056–1059. With 3 charts in text.

The paper describes a typical case of Weil's disease in a seaman aged 39 years. Diagnosis was made by the discovery of the leptospira and the production of a virulent infection in guinea-pigs inoculated with the urine, vein, blood and blood from the liver. Cultures of the organism were obtained in rabbit blood agar.

The case is of interest in that it appears to be the first properly diagnosed indigenous case in England. The only apparent source of infection was Thames water, the patient having imbibed considerable quantities a week before his illness commenced when he fell into the river. Notable features of the case were almost complete deafness during the initial pyrexia, intense muscular and joint pains and very evident pharyngitis and post-nasal catarrh. The author draws special attention to the last-mentioned condition, and though it appears to have been noted in none of the cases hitherto described, he thinks it suggests a possible path of entry of the organism from the mouth.

The patient had a definite relapse with an apyrexic interval of four days. After the second attack he made an uninterrupted recovery, the whole illness lasting 20 days.

The strain of the leptospira isolated in cultures from the inoculated guinea-pigs produced virulent infection in these animals. The patient's serum (0·5 cc.) completely protected these animals against infection not only of the patient's strain of leptospira but also against a strain isolated previously from English rats and the leptospira of yellow fever.

C. M. Wenyon.

INADA (Ryokichi). **Prophylaxis and Serum Treatment of Spirochaetosis icterohaemorrhagica.**—*Japan Med. World.* 1922. July 15. Vol. 2. No. 7. pp. 189–193.

We learn from this paper that prophylactic measures against Weil's disease have been in operation in Japan for some years. By the use of a vaccine it is claimed that the disease can be materially controlled. In a locality where the incidence was 15 to 30 cases a month, after the inoculation of 314 individuals there were only 5 cases in three months. At the Tagawa mine in 1919 there were 2,211 men who received one injection and 1,706 who had two: amongst the uninoculated the disease continued to occur frequently, whilst amongst the inoculated there were only three cases, two of which occurred before immunity had time to develop.

During the period July, 1919, to January, 1921, 10,268 men at the mine were inoculated. Of 47 cases of the disease which occurred in this period only 5 were amongst the inoculated. The inoculated group in August and September, 1920, comprised 4,262 men and the uninoculated 5,106 men.

It was found that the organism of the disease was killed in soil if lime nitrogen fertilizer was applied. Over a certain area of fields 41 lb. per acre were spread in 1920. Though 3,389 men and women were working in these fields no one contracted the disease, whereas in surrounding untreated fields many cases occurred. Further prophylactic measures adopted were the extermination of rats and the draining of mines, it having been noted that the disease did not occur in dry mines.

Treatment of cases by subcutaneous and intravenous injections of serum of immunized horses has been in use in Japan for over five years. It is claimed that good results have been obtained. Of severe cases the death-rate was 57·1 per cent. before serum treatment was introduced, while afterwards it was reduced to 34·7. Apart from the death-rate the symptoms are definitely mitigated by the intravenous use of serum in that fever more rapidly disappears, haemorrhages are less severe, while jaundice does not last so long. Abscess formation is a common feature of the disease, occurring in 24 per cent. of the cases which had no serum. In those which received an injection during the first six or seven days it was noted in only 4·9 per cent.

C. M. W.

GHETTI (Giorgio). **Spirochetosi ittero-emorragica sperimentale in giovani caprini.**—*Ann. d'Igiene.* 1922. June. Vol. 32. No. 6. pp. 513–516.

Previous attempts to infect goats with *Leptospira icterohaemorrhagiae* have not been successful. The author of this paper has, however, succeeding in infecting young animals. Two which were inoculated subcutaneously and intraperitoneally did not become infected, whereas two which were inoculated into the trachea acquired the disease, from which, however, they recovered. During the infection the animals suffered from fever and jaundice while the leptospira was present in the blood.

C. M. W.

VANNI (V.). **Sulla spirochetosi ittero-emorragica.**—*Policlinico.* Sez. Prat. 1922. Aug. 7. Vol. 29. No. 32. pp. 1038–1040. With 2 text figs.

The paper gives a record of a fatal case of jaundice. Guinea-pigs were inoculated and cultures of the organism obtained. There seems to be some doubt as to the diagnosis, for some of the author's remarks lead one to suspect that all the structures described as spirochaetes were not actually such. The figure of a section of the liver which was stained by Giemsa stain shows filaments coloured far too intensely. It is exceedingly difficult to stain the spirochaetes in sections at all except by the silver nitrate method. Similarly the dark-ground illumination is said to have shown that most of the spirochaetes were adherent to the red cells, a picture so unusual that one is inclined to think that these were the filaments which are commonly seen attached to red cells in normal blood. Similarly the figure of the section of a guinea-pig's liver is far from convincing. That the inoculated guinea-pigs died without showing jaundice or the extensive extravasations of blood so characteristic of infections with the spirochaetes of Weil's disease is rather remarkable.

C. M. W.

BLANCHARD, LEFROU & LAIGRET. **Note préliminaire sur des cas d'ictères épidémiques observés à Brazzaville (A. E. F.).**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 385–387.

The authors state that towards the end of the year 1921 and beginning of 1922 Dr. Laigret called attention to cases of infectious jaundice which occurred amongst natives in the Congo. The cases were of two types. The one was severe, with ictero-haemorrhagic symptoms and a yellow fever syndrome including black vomit, while the other was mild and resembled pneumonia complicated with jaundice. It appeared that in some cases the infection had been contracted in hospital. As regards the possible relationship to relapsing fever it is noted that this disease, though present previously, had ceased to occur before the end of the year, while jaundice had never been seen as a complication. Examination of the cases of jaundice led to the discovery of spirochaetes on four occasions (twice in urine, once in blood and urine and once in smears of liver). These were always scanty and in the fluids and were only found after centrifuging. They measured 7–12 μ in length and were very fine. In some the spirals were not evident, while in others they were definite.

From the case in which spirochaetes were found in both the blood and urine a guinea-pig was inoculated with blood. On the 20th day spirochaetes like those found in the blood of the patient were present in the blood of the guinea-pig. The animal died on the 25th day with marked jaundice and conjunctivitis. The organisms were present in the liver, kidneys and urine. A guinea-pig was successfully sub-inoculated.

Bed bugs to the number of 16 were collected from the bed of the patients and were crushed in saline solution. No spirochaetes were found in the emulsion which, however, produced an infection in guinea-pigs which was carried on through three passages. A guinea-pig inoculated with emulsion of bugs collected at a distance from the hospital did not become infected.

The two viruses obtained from the patient and that from the bugs were identical both as regards the disease they produced in the animals and in the morphology of the spirochaetes.

The infection resembles that of *L. icterohaemorrhagiae* but differs in the fact that bugs appear to act as reservoirs of the virus and that the disease responds to treatment with arsenicals.

C. M. W.

ZUELZER (Margarete). **Freilebende Wasserspirochäten als Krankheitserreger.** [Free Living Spirochaetes in Water as Disease Producers.]—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Oct. 24. Vol. 89. No. 1/3. pp. 171–175.

The discovery of spirochaetes in water, which resembled morphologically those of Weil's disease, has led to an investigation of their pathogenic properties. Cultures of these water spirochaetes were obtained in media which grow the similar organisms from cases of the disease and these were tested on guinea-pigs. Of six strains isolated from tap water it was found that only one was pathogenic to these animals, and that the symptoms and lesions corresponded with those produced by *Spirochaeta icterohaemorrhagiae*. The strain was also pathogenic to mice, and it was found that the virulence of the strain was not lost by successive sub-cultures in artificial media, though larger doses of culture were required to infect the animals.

Several observers have drawn attention to the close association of Weil's disease with dirty water and cases have been quoted in which it appears that the infection has been directly contracted from such a source. The discovery of a strain of water spirochaetes which not only morphologically but in their pathogenicity to animals appear identical with that of Weil's disease demonstrates that an apparently harmless free-living organism may, under certain conditions, acquire pathogenic properties.

C. M. W.

i. DUCAMP, CARRIEU & GUEIT. **A propos d'un cas de spirochétose ictérohémorragique.**—*Bull. Acad. Méd.* 1922. Apr. 18. 3rd Ser. Vol. 87. No. 16. pp. 427–428.

ii SIGALAS (R.) & PIROT (R.). **Présence de** *Spirochaeta icterohemorragiae* **chez les rats de Bordeaux.**—*C. R. Soc. Biol.* 1922. June 17. Vol. 87 No. 22. pp. 195–197.

i. The paper gives a description of a case of infectious jaundice which, though clinically typical, gave only negative results as regards actual spirochaetes and inoculation of guinea-pigs. A serological test against the organisms of Weil's disease gave a positive reaction in a dilution of 1 in 500.

ii. The authors have demonstrated by inoculation of guinea-pigs that rats in Bordeaux harbour *Spirochaeta icterohaemorrhagiae*. Two were found infected out of 33 examined.

C. M. W.

i. SAKA (Masayoshi) & MIYANAGA (Ichiro). [**On the Pure Cultivation of** *S. icterohemorrhagiae* **in the Fluid Medium.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1922. Mar. Vol. 29. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Aug. 15. Vol. 2. No. 8. p. 243.]

ii. SAKA (Seigi). [**Comparative Studies on the Proofs of the Immune Bodies in the Anti-ictero-hemorrhagic Serum.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*) 1922. May. Vol. 29. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 265.]

iii. KATAYAMA (Takeichi). [**On the Blood Features, especially Blood Platelets, in Experimental Weyl's Disease.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1922. May. Vol. 29. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 265.]

i. This note merely states that the authors have shown that the most suitable liquid media for the cultivation of *Leptospira icterohaemorrhagiae* are 5–10 per cent. of acacia or 2 per cent. of "funori" or gloiopeltis glue.

ii. The presence of immune bodies in the serum of cases of Weil's disease can readily be demonstrated by the agglutination test as carried out by OHBA. In the experimental disease it is the earliest sign of infection.

iii. As in the case of Weil's disease, there is a decrease in the number of platelets in the blood in simple obstructive jaundice. It follows, therefore, that the decrease in Weil's disease is merely a result of the jaundice and has no specific meaning.

C. M. W.

INADA (Ryokichi), IDO (Yutaka), KANEKO (Renjiro), HOKI (Rokuro), ITO (Hiroshi), WANI (Heditsune) & OKUDA (Kikuzo). **Sulla scoperta della *Spirochaeta ictero-haemorrhagiae*, nuovo agente patogene della cosidetta malattia del Weil nel Giappone e sulle più recenti ricerche su questa malattia.**—*Boll. d. Istituto Sieroterapico Milanese.* 1917. Mar. Vol. 1. No. 1. pp. 1–9. With 1 plate. [Received Oct. 16, 1922.]

INADA (Ryokichi), IDO (Yutaka), HOKI (Rokuro), ITO (Hiroshi) & WANI (Hidetsune). **La sieroterapia endovenosa della mallatia di Weil** (*Spirochetosi ittero-emorragica* **Inada**).—*Boll. d. Istituto Sieroterapico Milanese.* 1917. Nov. Vol. 1. No. 2. pp. 111–129. (Received Oct. 16, 1922.]

KANEKO (Renjiro) & OKUDA (Kikuzo). **Sulla distribuzione della *Spirochaeta ictero-haemorrhagiae* negli organi dei pazienti trattati con la sieroterapia endovenosa.** *Boll. d. Istituto Sieroterapico Milanese.* 1917. Nov. Vol. 1. No. 2. pp. 131–134. [Received Oct. 16, 1922.]

YELLOW FEVER.

PETERSON (E.). **Yellow Fever in St. Thomas, with Special Reference to its Spontaneous Elimination.**—*U.S. Nav. Med. Bull.* 1922. Oct. Vol. 17. No. 4. pp. 555–570.

Yellow fever, which was formerly endemic in the island of St. Thomas in the West Indies, gradually disappeared without any active steps having been taken to eradicate it. The paper traces the history of the disease in the island since the first available record in 1702. Details are given of the number of deaths which occurred during the 50 years following 1852, when certain records were commenced in St. Thomas. The island was originally of some strategic importance and served as a station for troops, so that one of the factors necessary for the continuance of the disease in the shape of constant importation of non-immunes existed. The stegomyia was present as also the virus, so that cases of the disease occurred more or less continuously. The island lost its position as a strategic post and the influx of susceptible adults through shipping gradually diminished. The result of the reduction in the number of non-immunes and the acquirement of a permanent immunity by the inhabitants has led to the disappearance of yellow fever from the island—the new-born being insufficient in numbers to keep the endemic alive. The author sees in the history of the island an illustration of the principles laid down by H. R. CARTER [see this *Bulletin*, Vol. 17, p. 384.] If yellow fever holds its own it is evident that three factors are present, namely mosquitoes, virus and non-immunes. The number of mosquitoes necessary to maintain the disease varies with the number of non-immunes present. The minimum number of mosquitoes necessary in any locality is the critical number, and this becomes less or greater as the number of non-immunes is increased or diminished. If the disease is just maintaining itself then the mosquitoes are near the critical number, so that yellow fever loses ground if the number of non-immunes is reduced or if the mosquitoes fall below the critical limit. In St. Thomas it appears that the latter occurred, so that yellow fever was spontaneously eliminated.

C. M. Wenyon.

VIEIRA (Borges). **Pesquizas sobre a etiologia da febre amarella na zona de Nazareth, Estado da Bahia, em 1921.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1921. July & Aug. Vol. 4. 2nd Ser. Nos. 5 & 6. pp. 137–144.

An account of the author's investigation, at the request of Dr. Carlos CHAGAS, of an outbreak of yellow fever in the district of Nazareth, State of Bahia, Brazil, in May 1921. The author had had the advantage of working at New York with cultures of *Leptospira icteroides* isolated by NOGUCHI. The outbreak, though in Vieira's opinion one of genuine yellow fever, was, on the whole, of benign type, and attempts to isolate the Leptospira from the blood of those suffering were uniformly unsuccessful, as, also, were inoculation experiments on guinea-pigs and immunization experiments on Pfeiffer's lines with serum from recent patients and cultures of *Leptospira icteroides* from NOGUCHI's laboratory. The epidemic was waning when the author arrived to investigate it and the absence of positive microscopical experimental results may be perhaps attributed to the small number of cases observed and to the fact that none were seen in the earliest phase of the disease.

F. S. Arnold.

BARRETO (A.). **Febre amarella no nordeste brasileiro.** [Yellow Fever in North Eastern Brazil.]—*Arch. Brasileiros de Med.* 1921. Mar. Vol. 11. No. 3. pp. 205–244. With 2 figs. in text.

The author gives an account of two epidemics which he investigated in 1919 and 1920 in North Eastern Brazil. He concludes that the disease, which attacked children as frequently and as virulently as it did adults, was typically yellow fever. Malaria was excluded by examination of the blood, and Weil's disease by the rapidity with which the serious cases succumbed. The disease in children is frequently certified as pernicious malaria, infantile cholera, intestinal auto-intoxication and other conditions.

C. M. W.

ZAPATA (Carlos Enrique). **La fiebre amarilla en Piura. Breves consideraciones acerca de su naturaleza.**—*An. Facul. de Med. de Lima.* 1920. Nov.–Dec.; 1921. Jan.–Feb. Vols. 6 & 7. Nos. 18 & 19. pp. 208–231. With 1 map. pp. 32–46. With 1 chart in text.

The history of the yellow fever epidemic which occurred in Peru has already been given by H. R. CARTER (this *Bulletin*, Vol. 19, p. 568). The author of the present paper describes the outbreak as it affected the Province of Piura, especially its principal town, Paita. The measures directed against the mosquito and the immediate isolation of all suspicious and authentic cases resulted in the disappearance of the disease in Paita itself, but owing to the failure of the people in the outlying districts to cooperate in the prophylactic measures the disease was still extant in the province at the time the paper was written.

C. M. W.

NOGUCHI (Hideyo) & PAREJA (Wenceslao). **Prophylactic Inoculation against Yellow Fever.**—*Jl. Amer. Med. Assoc.* 1921. Jan. 8. Vol. 76. No. 2. pp. 96–99. [Received Oct. 1922.]

This paper, which was published before the one reviewed in the *Bulletin,* Vol. 18, p. 249, gives an account of experiments conducted on guinea-pigs with the object of determining the protective power of a vaccine of *Leptospira icteroides.* It was demonstrated that when sufficient quantities of killed cultures were given the animals were usually resistant to subsequent inoculation with *Leptospira icteroides.* The degree of protection, however, was not proportional to the quantity of vaccine given. The result of the trial of the vaccine in human beings in Guayaquil is also mentioned but these results have been more fully noted in the later papers reviewed in the *Bulletin.*

C. M. W.

NOGUCHI (Hideyo). **Etiology of Yellow Fever. XIV. Duration of the Protective Effect of Anti-Icteroides Immune Serum after Subcutaneous Inoculation into Animals.**—*Jl. Experim. Med.* 1922. Sept. 1. Vol. 36. No. 3. pp. 357–364.

Reference is made to 187 cases of yellow fever treated by immune horse-serum. The results have already been noted [this *Bulletin,* Vol. 19, pp. 563–564]. Owing to the fact that amongst groups of individuals who have been injected with a vaccine of *Leptospira icteroides* a certain number may contract the disease within 13 days of vaccination, and as the incubation period of yellow fever is six days, it became evident that infection must have taken place in some instances while protection was developing.

A series of experiments was conducted with the object of determining if it would be possible to confer an immediate protection by the injection of immune serum. Guinea-pigs were injected with varying quantities of serum and subsequently inoculated at different intervals with a virulent strain of *Leptospira icteroides.* By the administration of a dose of serum so minute as 0·002 cc. per kilogram of body-weight a complete protection lasting five days was immediately produced. After this period the protection was rapidly lost. To maintain an immunity of 10 days' duration it was necessary to administer 0·2 cc. of serum.

It appears from these results that theoretically it would be necessary to give a man of 80 kilos an injection of 0·16 cc. of serum to produce an immunity of five days' duration, or 1·6 cc. for one of seven days, or 16 cc. for one of 10 days.

C. M. W.

WILKINSON (E.). **Notes on Two Cases reported as Yellow Fever.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Aug. Vol. 15. No. 10. pp. 48–52.

The paper describes two instances of outbreaks of disease, in some cases terminating fatally, on board ships returning from West Africa, which were at first suspected to be yellow fever and were reported to the Ministry of Health. In both instances careful investigations proved that the disease was malignant tertian malaria. The diagnosis of one case was complicated by the presence of an inguinal bubo in which an organism resembling *Bacillus pestis* occurred. It was proved by animal inoculations to be some other organism.

C. M. W.

HOFFMANN (W. H.). **La profilaxia de la fiebre amarilla.** [The Prevention of Yellow Fever.]—*Rev. Méd. de Hamburgo.* 1922. Vol. 3. No. 8. pp. 218–220. With 1 text fig.

A brief review of the subject of yellow fever, its causes and prevention, entering also again into the question whether the *Leptospira icteroides* is the causative organism of this disease or not, and casting doubt on the value of NOGUCHI's prophylactic injection, since this is always accompanied by other measures such as isolation of the sick, destruction of mosquitoes, and so forth. [See previous numbers of this *Bulletin.*]

H. Harold Scott.

HOFFMANN (W. H.). **The Histopathology and Haematology of Guinea-Pigs infected with** *Leptospira icteroides.*—*Jl. Trop. Med. & Hyg.* 1922. Nov. 15. Vol. 25. No. 22. pp. 353–360.

——. **Estudios experimentales sobre las leptospirilosis.**—Reprinted from *Rev. Méd. de Hamburgo.* 1922. Vol. 3. No. 3. pp. 80–81.

——. **Estudios comparativos de la sangre en las infecciones experimentales con** *Leptospira icteroides* **y** *Leptospira icterohaemorrhagiae.*—*Laboratoria de Investigaciones y Estudios.* Habana, Cuba. 1922. 11 pp. With 21 charts.

The contents of these papers appear to be the same as of that reviewed in this *Bulletin,* Vol. 19, p. 565.

C. M. W.

CARTER (H. R.). **La epidemia de fiebre amarilla en el Perú durante los anos 1919 y 1920.**—*Cronica Med.* 1922. Aug. Vol. 39. No. 710. pp. 297–311.

LEPROSY.

Rogers (Leonard). **An Address on the Spread, probable Mode of Infection, and Prophylaxis of Leprosy.**—*Brit. Med. Jl.* 1922. June 24. pp. 987–990.

The author began his address with a brief historical review of leprosy and its passage to new countries. The disease as it more or less disappeared from England and most parts of Europe advanced eastward, reaching the islands of the Pacific in the second half of the last century. The hereditary theory of infection is now entirely discredited and it is seen to be contagious. Hansen discovered the *Bacillus leprae* and refuted the hereditary theory in the years 1874 to 1879. Leprosy is not influenced by climate and is found from Iceland to the Equator; nevertheless, it seems to be more virulent in tropical areas. Under the heading "Modes of Infection," a most interesting table is given:—

Table of 700 *Recorded Cases of the Probable Source of Infection in Leprosy.*

Mode of Infection.	Number.	Percentage.	
Conjugal	85	12·14	18·28
Cohabiting	43	6·14	
House	180	25·7	39·84
Room	35	5·0	
Bed	64	9·14	
Attending on Lepers	139	19·87	19·87
Leper Playmate	23	3·28	19·42
Close Association with Leper	113	16·14	
Wet Nurse	8	1·14	2·59
Wearing Leper's clothes	3	0·43	
Vaccination	4	0·59	
Inoculation from Leper	3	0.43	

"In considering these figures it is worth recalling that the stock arguments of the anticontagionists were that the disease was rarely transmitted from husband to wife and *vice versa*, and was very rare among attendants on lepers, yet my table shows that almost one-fifth of the recorded infections fall into each of these two classes . . . the outstanding feature of the analysis is that in the very great majority of the cases there were frequent and prolonged opportunities of contact in a house inhabited by a leper . . . "

The author next considers the precise manner in which the leprosy bacilli pass from one person to another: it may well be either through their ingestion in food or by inoculation through some minute abrasion in the skin or in a mucous membrane such as that of the nose, mouth and gastro-intestinal canal, as in many cases of tubercle. [*B. leprae* is acid-fast as is the bacillus of tubercle.]

"The frequency with which anaesthetic leprosy beginning in the lower extremities, has been observed in bare-footed races, as in Crete, Java, Abyssinia, the Sudan, etc., is only readily explainable on the inoculation theory.

> " Of great significance in this respect is the strong suspicion that in rare instances leprosy has been transmitted by arm-to-arm vaccination, as in Professor Gairdner's cases of a European child developing leprosy after being vaccinated from a native child of leprous family in the West Indies, and another European child vaccinated from the first showing the disease after his return to England ; and those of Hillis, in which a brother and sister of a Portuguese family both got leprosy after vaccination from the same source."

The principles of prophylaxis and causes of failure bear out the necessity for early segregation. " By far the most infective type of leprosy is the tubercular [nodular is a better term and avoids any confusion with true tuberculosis] form, including mixed cases with discharge of large numbers of bacilli from the nose and breaking down nodules."

Sir Leonard Rogers is one of those intimately connected with the fortunate advance in the treatment of leprosy and the last paragraph in this address is perhaps the most interesting and important :—

> " Now that we possess in the soluble preparations of the active unsaturated fatty acids of chaulmoogra, cod-liver, soya bean and other oils introduced by me, a reliable method of clearing up the bacillus-bearing lesions of leprosy, with loss of infection, including cessation of the discharge of the organisms from the nose, lepers have for the first time a powerful incentive to come forward for treatment as early as possible instead of hiding their terrible calamity."

J. H. Tull Walsh.

TALWIK (S.). [**La lèpre dans la Province de Oesel. Recherches épidémiologiques avec une introduction historique.**] 1921. Dorpat. 1 Vol. 209 pp. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 7. pp. 219–221 and *Bull. Office Internat. d'Hyg. Publique.* 1922. June. Vol. 14. No. 6. pp. 725–726.]

The author writes from an experience of 18 years in the Oesel district of Esthonia, including charge of the leper asylum. A study of old documents shows that leprosy has persisted in the Baltic Provinces since it was introduced by German Crusaders in the 12th century, and a table of 437 cases since 1818 shows 62·23 per cent. to have been females, an unusual predominance which he attributes to many of the males going abroad to work in the spring. Nodular cases formed 55 per cent. of the whole and especially predominate in newly affected parts where the disease is increasing. He has met with 10 abortive cases undergoing complete cure. In 115 marriages conjugal infection only occurred in 4·75 per cent. and in only 3 per cent. of nodular cases, and the author asks whether this may be due to gradual immunization by small quantities of the germs. The proportion of lepers increased from 20 to 60 years of age and then decreased. Isolation has been carried out since 1892, the largest number being reached in 1904 with 95 cases, decreased to 62 in 1920, 79 per cent. of the cases being interned. Nodular cases have increased and the cases occur in groups of 2 to 10, 69 of 375 villages being infected, nearly three-fourths being confined to a small area of the district, while the cases are concentrated in one or two houses in each village. Where the husband is a leper twice as many households have no children than where the wife is leprous, and 5·4 per cent. of the children are affected where the father is a leper and 7·1 when the mother is a leper ; 96·3 per cent. of contagions were in relation to nodular cases, two-thirds from recent cases and one-third from cases of over six years' duration, while the nervous form was but slightly contagious. For prophylaxis, tracing and interning cases are the most important means.

L. Rogers.

SPIRE. **La lèpre au Dahomey.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. Apr.-May-June. Vol. 19. No. 2. pp. 166-172.

Leprosy occurs in all parts of Dahomey, but is most prevalent in the North, especially in the circles of Djoujou and Savalou. It decreases as the coast is approached, which supports the theory of TEXIER that the disease was imported by caravans going from Sokoto to the Gold Coast, the total estimated number of cases being 7,700, of which 5,500 are in the above mentioned circles. The contagiousness of the disease is generally recognized and creditors instal lepers at the doors of their debtors in order to obtain payment of their dues. When lepers are attacked by smallpox the lesions disappear temporarily only. Some of the tribes have little fear of leprosy and permit the healthy to marry the diseased, but others forbid such marriages and isolate cases in the forest, taking food out to them, while it is believed to be dangerous to pick up a needle dropped by a leper. Nodular cases are a little more common than nerve cases. Notification of lepers is compulsory and some efforts have been made at isolation without much success, as the people object to any interference with their liberty, but it is now proposed to found leper colonies with land for cultivation.

L. R.

PUBLIC HEALTH REPORTS. 1922. June 2. Vol. 37. No. 22. p. 1313. —**Leprosy in Para, Brazil.**

Dr. H. C. de Souza ARAUJO records that in March 1922 there were 1,135 known lepers in the City of Pará and 104 more cases in the interior of the State, notification and supervision being compulsory, but only 255 were isolated in a hospital and 66 in their houses, the rest being free but under supervision. Treatment with chaulmoogra oil was being carried out, 16,727 injections being reported to date with favourable results. A hospital for isolating all the lepers is under consideration.

L. R.

CORLETT (William Thomas). **The Present Status of Leprosy in the Hawaiian Islands.**—*Arch. Dermat. & Syph.* 1922. Nov. Vol. 6. No. 5. pp. 607-615. (Discussion, pp. 615-618.)

A brief history of leprosy in the Sandwich Islands is first given from the great increase of the disease in the middle of the 19th century following the advent of numerous Chinese, the foundation of an observation and detention hospital at Kalihi near Honolulu and of the Molokai leper settlement on an isolated promontory eight square miles in extent in 1865. Here 1,587 lepers were received in the next ten years, although the yearly numbers admitted in the first two decades varied between 487 in 1873 and 43 in 1886 with alterations in the policy of different Governments, for as MOURITZ in his History of Leprosy in the Hawaiian Islands states "The segregation of lepers has been irregular, spasmodic, and efficient only at certain periods . . . The efforts to stamp out leprosy by segregation have taken on the status of a political football . . . and to placate voters and gain their votes the enforcement of the segregation law has been purposely allowed to lapse temporarily." Since then federal control has been partially accomplished, but confusing and conflicting reports by interested parties have been published from time to time. Even after the United States took over the Islands an attempt adequately to equip Molokai was frustrated by a change of national policy: all facts of great importance in judging of the limited effects of the segregation policy in Hawaii.

The treatment of leprosy by chaulmoogra oil is next considered. POWER separated certain fatty acids in 1904. The ethyl esters patented in 1910 as antileprol were used in Turkey and Egypt and in Hawaii from 1910 to 1914 and later by DEAN in 1919 with about the same results that ROGERS was getting in India. Between July 9, 1919, and March 31, 1921, 140 patients were paroled from the Kalihi hospital and 60 discharged from the Molokai settlement, but 16 of the former and 11 of the latter are known to have relapsed and longer treatment with greater caution in giving parole is now adopted. Owing to the efficient services of the board of health there are fewer lepers at large in Hawaii than in other countries with as many lepers, and early cases are coming forward in much larger numbers for the improved treatment. During the last few months the ethyl esters have been given in selected cases intravenously in 1cc. doses two or three times weekly. [MUIR in Calcutta has long used this preparation intravenously in resisting cases.] The precise mode of dissemination of the disease is still unknown, and further research is required.

L. R.

DE LANGEN (C. D.). **De Leprabestrijding in de Sandwich-eilanden.** [The Combating of Leprosy in the Sandwich Islands, Hawaii.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 2. pp. 212–223. With 1 chart.

During a visit to Honolulu the author studied the measures taken there in the leprosy campaign. DEAN showed him the preparation of the new drugs from the crude chaulmoogra oil (the chemical details are given in the chart). De Langen is sceptical whether real cures have been obtained. In many cases, discharged "on parole," he thinks the bacillus might be found by repeated examination. Anyhow, prolonged treatment remains always necessary. About one-fourth of the patients show important reactions after the injections. The psychical condition of the patients is excellent, because the prospect of healing and discharge "on parole" takes away a good deal of the gloom of the disease. The infirmaries are well built and well managed.

W. J. Bais.

VAN DRIEL (B. M.). **Over Behandeling en Bestrijding van Lepra.** [On Treatment and Combating of Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 2. pp. 149–163.

The author reports on his experiments with "Collobiase de Chaulmogra" (Dausse, Paris; manufactured by Laboratoires Clin), which he found to be absolutely useless, even in doses much larger than those recommended by the manufacturers. After considering the various preparations lately recommended for the treatment of leprosy he concludes that their efficacy is not yet beyond doubt. They are, moreover, expensive. In the leper colony, Lao Simomo, of which the author is in charge, he administers the crude chaulmoogra oil (15 parts mixed with 85 parts of coconut oil) in daily doses up to 10 cc. of the mixture. This is very cheap. He considers, however, the isolation of the lepers as of far greater importance. Lao Simomo is made as attractive as possible to the native lepers, thereby strongly promoting the thoroughness of the isolation. The money paid for the upkeep of such an institution is well spent, because "The leper colonies do not heal the lepers but they deliver the population from leprosy."

W. J. Bais.

HOFFMAN (Frederick L.). **Is Leprosy Increasing?—An Address delivered at a meeting of the American Medical Association, New Orleans, La.** 1920. Apr. 26. 53 pp. With 2 charts. Newark, N.J.: Prudential Press.

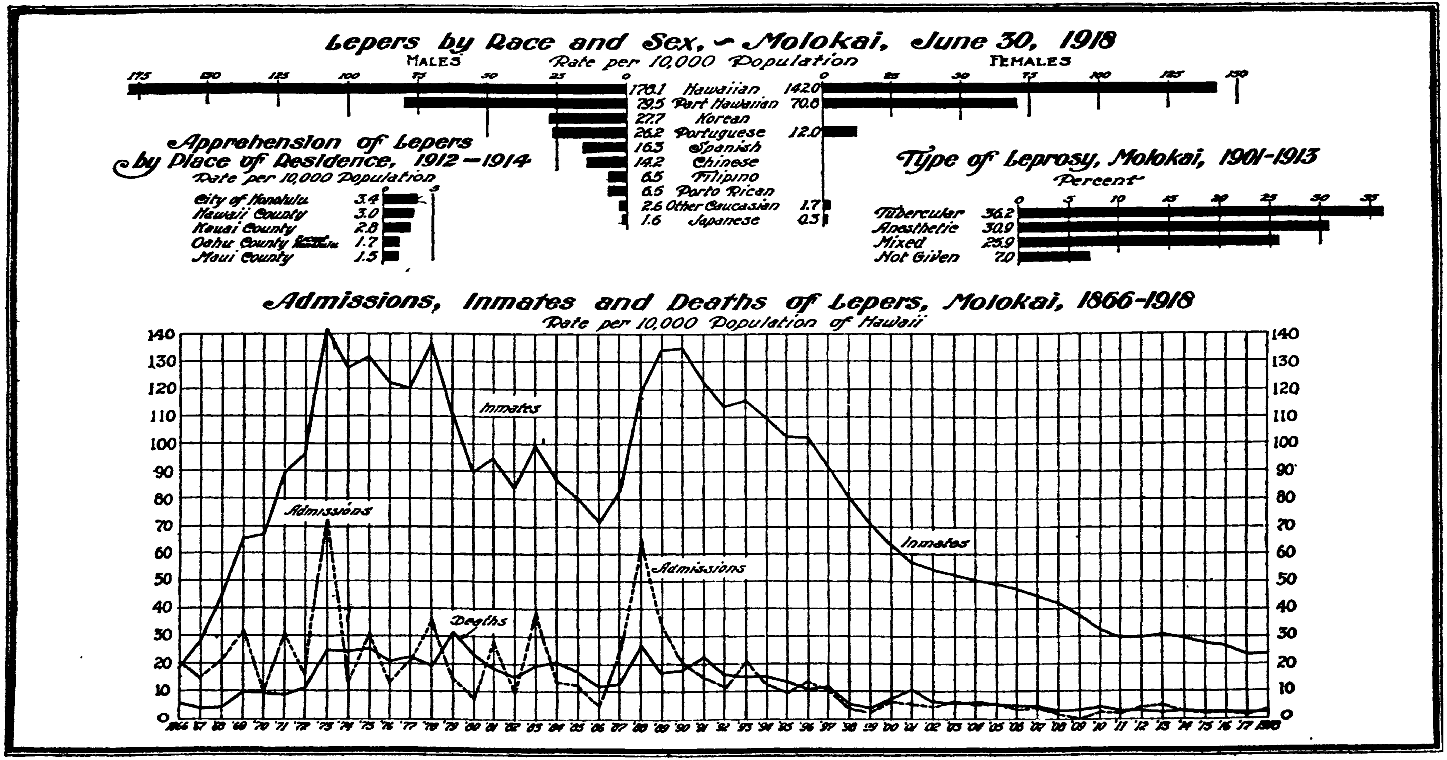
This paper deals at length with the prevalence of leprosy in the United States more particularly and in South America, and includes a list of nearly 250 cases reported in the United States between April, 1916, and April, 1920. The writer thinks there are probably 400 to 500 cases, and although this is a more conservative estimate than some earlier ones, he considers the disease is slowly increasing with the formation of new foci, and constitutes a serious menace. The bill enacted in February, 1917, providing $250,000 for a federal leprosarium has not yet been applied, but the site selected at Cedar Keys, Florida, seems likely to be adopted shortly. He thinks others should be provided on the Pacific and Atlantic coasts and in the Central West. The first leper home was established in Louisiana, where 80 per cent. of the lepers are white, although only 57 per cent. of the population is white, but more coloured cases are probably concealed as the average age on admission of the latter is higher than in the case of the whites, the greatest frequency of admissions being from 20 to 29 years and the duration of the cases 8–10 years. A chart illustrating the admissions to the Louisiana leper home shows some increase since 1909. Another chart (see opposite) shows for Molokai, Hawaii, the number of inmates, admissions and deaths yearly per 10,000 population from 1866 to 1918, which brings out very well the ill effects of fluctuating policies in the earlier years and the steady decline in leprosy during the last two decades under American control.

L. R.

NEVEU-LEMAIRE. **Les grandes endémo-épidémies inter-coloniales: la lèpre.**—*Presse Méd.* 1922. Sept. 20. Vol. 30. No. 75. pp. 1565-1573. With 5 text figs.

Leprosy is described as a chronic infectious disease the bacillus of which lives exclusively in the skin and nerves, possibly conveyed by biting insects or by acari. The well-known general distribution of the disease is mentioned, and that in the French Colonies described more fully, based on previous papers on the subject by JEANSELME and KERMORGANT. The most interesting feature of the paper is a map of Madagascar showing the leprosy rates per mille in the various

Leprosy in Hawaii



(Reproduced from Dr. F. L. Hoffman's publication, "Is Leprosy increasing?")

districts and bringing out the fact that all the areas with the high rates of from 5 to 10 per mille are in the eastern area, which has the highest rainfall. The writer concludes that the leprosy question in the French Colonies is a very serious one, as whites as well as natives are attacked, and many of the former return to France, especially to Paris, where no sanitary regulations can be enforced against them, so they may become a danger.

L. R.

DELAMARE (G.) & CHUKRI (Hassan). **Altérations radiologiques des mains et des pieds dans un cas de lèpre mutilante.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Oct. 19. 3rd Ser. Year 38. No. 27. pp. 1321–1325. With 5 text figs.

—— & ——. **Altérations radiologiques des mains et des pieds dans un cas de lèpre mutilante avec lésions ainhumi-formes.**—*Ibid.* Nov. 2. No. 29. pp. 1396–1399. With 3 text figs.

These two papers include descriptions of the X-ray appearances of the hands and feet in two cases of anaesthetic leprosy showing the usual atrophy of the phalanges and osteoporosis, with escape of the articular surfaces, as pointed out by MANSON. The two illustrations reproduced opposite are more informing than any verbal description. One case somewhat resembled ainhum.

L. R.

DAVIS (Haldin). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* (Sect. of. Dermat.). 1922. Sept. Vol. 15. No. 11. p. 49.

This case is of interest on account of the probably very long incubation period of 21½ years. The patient was a woman, aged 68, a native of Riga, which she left 22 years ago. She has since lived in England and Philadelphia, where it is very improbable that she contracted the disease, which only appeared six months ago. It was at first mistaken for mycosis fungoides, but anaesthesia was present and the leprosy bacillus was found.

L. R.

WALLACE (Alexander). **Notes on an Unusual Case of Leprosy.**—*Southwestern Med.* 1922. May. Vol. 6. No. 5. pp. 193-196. With 1 text fig.

A Mexican waiter, aged 51, who came with paraesthesia around the left eye, which was diagnosed as syphilis, a positive Wassermann being present, as in 70 per cent. of lepers. He improved under arsenical injections. After 18 months he returned with typical macular and anaesthetic leprotic patches and facial appearance, leprosy bacilli being found in the lesions, and he did well on injections of chaulmoogra oil and ethyl ester chaulmoograte.

L. R.

WALKER (Ernest Linwood). **Contributions to the Bacteriology of Leprosy. I. The Diphtheroid in Leprosy.**—*Amer. Jl. Trop. Med.* 1922. July. Vol. 2. No. 4. pp. 293–303.

Bacteriologists are still very sceptical whether the *Bacillus leprae* of HANSEN has ever been cultivated. The successes reported by competent workers are of two types: (1) partly acid-fast diphtheroids

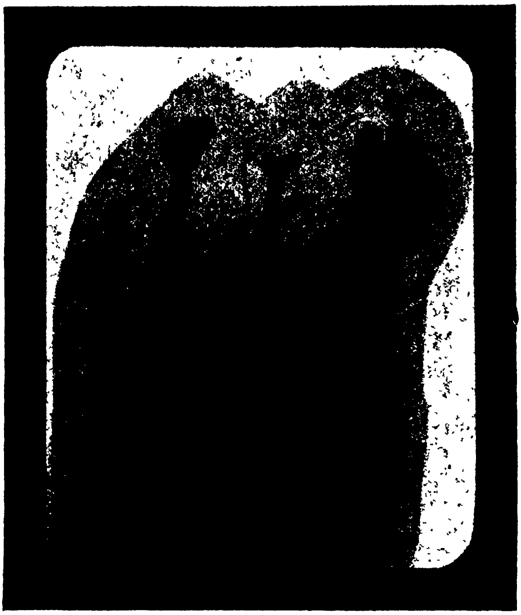


FIG. 1.

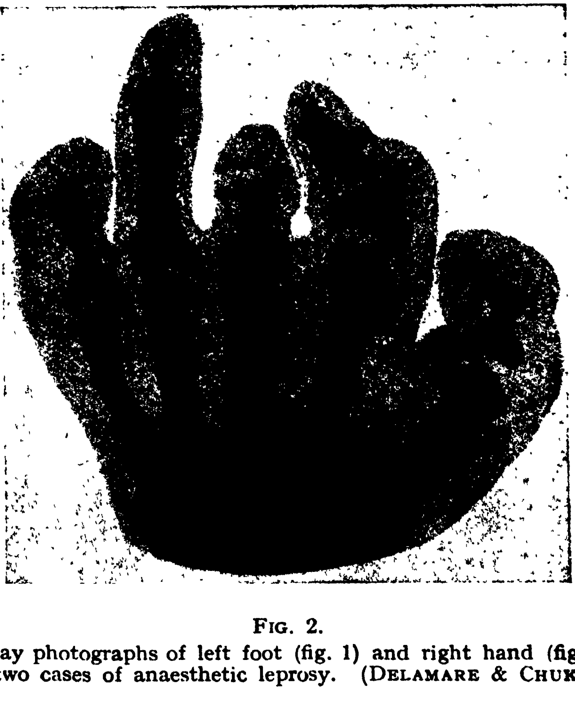


FIG. 2.

X ray photographs of left foot (fig. 1) and right hand (fig. 2) of two cases of anaesthetic leprosy. (DELAMARE & CHUKRI.)

[Reproduced from *Bulletins et Memoires de la Société Médicale des Hôpitaux de Paris.*]

first cultivated by BORDONI-UFFREDUZZI in 1887, and 16 times since by other observers up to 1914; and (2) the chromogenic acid-fast bacilli first cultivated by CLEGG in 1909. The present paper deals with the first group as obtained by cultures from nasal and dermal ulcers of lepers at San Francisco, and a few incisions of nodules. The sterile swabs were rubbed up in a little saline and three dilutions made in glycerinated veal broth agar and any diphtheroids transplanted on to glycerine agar. In 164 cultivations from 16 lepers, which were incubated sufficiently long, four types of diphtheroids were obtained in the following proportions: 26, 61, 12 and 26 respectively. The first group was the well-known pseudo-diphtheria bacillus of HOFFMANN; the second most common type was not acid-fast, nor was the third, which only differed slightly from the second, neither apparently having been fully described before. The fourth group was acid-fast and presented characteristic colonies with extreme pleomorphism and partial acid-fastness of BORDONI-UFFREDUZZI and subsequent workers. It has only been obtained from the noses of advanced nodular or mixed cases of leprosy showing many acid-fast *Bacillus leprae* in the nasal secretions, while it was absent or very scanty in cases in which long treatment with esters of chaulmoogric acid had produced great improvement with diminution or disappearance of acid-fast bacilli from the nasal secretions.

Having thus confirmed those who had previously cultivated such organisms from leprous lesions, Walker sought to discover a possible saprophytic source for this diphtheroid as bearing on its parasitism an etiologic relation to leprosy. In this connexion he studied the smegma bacillus, and found that cultivations from smegmal secretion yielded only colonies of staphylococci and a diphtheroid of extremely pleomorphic acid-fast nature, frequently showing acid-fast granules and segments, which appeared to be the only diphtheroid in smegma preputii able to grow on glycerine agar. It presented cultural, morphological, biochemical and tintorial characteristics which are apparently identical with those of the diphtheroid cultivable from the lesions and organs of lepers and considered by some to be the cultural form of *B. leprae.*

L. R.

MARCHOUX (E). **La lèpre du rat est peut-être transmissible à l'homme.**—*Bull. Acad. Med.* 1922. May 16. 3rd Ser. Vol. 87. No. 20. pp. 545-547.

Last year Marchoux described a bacillus obtained from a young Haitian with an affection taken for leprosy, an acid-resistant bacillus, which he considered to differ from those of HANSEN and KOCH, and called provisionally *Mycobacterium pulviforme* [see this *Bulletin,* Vol. 18, p. 407]. He now reports having infected white rats by the injection of the spleen-pulp rich in the bacteria, some of the animals dying with acid-fast bacilli at the site of injection, in the neighbouring glands and in connective tissues with undoubted multiplication of the organisms, while on passage into another rat more extended lesions were found. He therefore asks if the original patient could have been accidentally infected with rat leprosy, but he considers that the evidence proves only that there exists in man a disease resembling leprosy and caused by an acid-fast bacillus which is transmissible to white rats.

L. R.

GOMEZ (Liborio), BASA (Jose Avellana) & NICOLAS (Catalino). **Early Lesions and the Development and Incidence of Leprosy in the Children of Lepers.**—*Philippine Jl. Sci.* 1922. Sept. Vol. 21. No. 3. pp. 233–256. With 6 plates.

This is an interesting account of the early lesions of leprosy in children born of leper parents in the Culion Colony of the Philippines, where " the immense majority of the children born of leper parents were permitted to live with them and among other lepers " ; a lamentable state of affairs. Between 1906 and 1921 inclusive, 689 children were born, 333 died, 51 were sent away from Culion, 3 returning later, and at the end of 1921, 308 were living in the colony, both parents of practically all having been lepers, the majority living among lepers, while a limited number were isolated in a healthy children's house after having been in intimate contact with lepers for varying lengths of time. During nine months repeated clinical and bacteriological studies have been made of all the children in the colony, with the following results.

The mortality among the children under 1 year has been high, 42 per cent., or practically the same as in Manila, but more died of debility and less from infantile beriberi, owing to only unpolished rice being used. Bacteriological examinations of the skin lesions and of the nose in early cases in the children showed definite lesions in the septum in all positive nasal examinations, while every one of them also gave positive skin examinations. Of 24, however, with positive skin lesions, only 13 gave positive nasal findings, which is greatly against STICKER's theory that the nose is the seat of the primary lesion of leprosy.

The earliest lesions were smooth, level, irregularly shaped, whitish fawn-coloured maculae, most frequently on the trunk, buttocks, thighs, arms and face, which in their early stages show no loss of hair, sweating, or sensibility to touch or temperature. Older patches develop a reddish tint, when lepra bacilli are first found, and distinction between heat and cold is lost, followed by that of touch, loss of sweating and of hairs, etc. Another early sign is a shiny and flushed appearance of the legs, with or without the white patches. Anaesthesia was usually first noted on the peroneal side of the leg and ankle and the ulnar side of the forearm and back of the elbow. There was no clear history of bullae formation, which DYER and GWYTHER considered to be one of the first manifestations of leprosy. Gradual thickening with the increase of the bacilli produce the typical lesions of leprosy, the purely macular lesions being mostly seen in the younger and infiltrations in older children. Both may be illustrated in brothers and sisters. In four children bacteriologically negative patches disappeared later, and once this occurred with a bacteriologically positive case.

The effect of segregation on the development of the disease has also been studied in the case of 83 children born in the colony and isolated in a house for the healthy at ages varying between a few months and 8 years, up to which they were exposed to infection ; 25 had died, 5 had been transferred from the colony, 22 remained negative, and 26 were returned for leprosy or suspicious signs of the disease. Of the latter, after repeated examinations, 4 were found not to be lepers, while of the remaining 22 with signs of the disease 11 were bacteriologically positive and 11 negative, to which are added 2 children returned to the colony with leprosy, the data regarding the whole 26 cases being shown in Table 4.

TABLE 4.—*Children isolated at the Negative Children's House as non-lepers and later returned to the Colony on account of definite or suspicious signs of Leprosy.*

[(+) Positive clinically and bacteriologically.]

No.	Initials.	Date of Birth.	Age on January 1, 1922.			Age when isolated.			Age when definite or suspicious signs of leprosy developed.			Period of isolation.		
			y.	*m.*	*d.*	*y.*	*m.*	*d.*	*y.*	*m.*	*d.*	*y.*	*m.*	*d.*
1	J. R. (+)	Mar. 30, 1911 ..	10	9	1	5	1	26	5	5	25	0	3	29
2	A.T. (+)	Feb. 19, 1910 ..	11	10	12	6	4	28	6	11	13	0	6	15
3	P. I. (+)	June 25, 1914 ..	7	6	6	1	9	0	2	6	7	0	8	7
4	B. R. (+)	June 14, 1914 ..	7	6	17	2	1	3	2	10	(?)	0	9	0
5	E. S. (+)	Sept. 8, 1911 ..	10	3	23	4	10	19	6	(?)		1	2	(?)
6	R. N. (+)	Oct. 17, 1911 ..	10	2	14	4	5	12	5	8	13	1	2	2
7	F. A. ..	Jan. 20, 1919 ..	2	11	11	1	4	0	2	7	18	1	3	18
8	A. F. ..	June 13, 1914 ..	7	6	18	1	11	13	3	5	26	1	6	13
9	V. C. ..	Sept. 8, 1913 ..	8	3	23	2	10	9	4	6	25	1	8	16
10	L. de C.	Feb. 20, 1913 ..	8	10	11	3	3	6	5	0	27	1	9	21
11	A.V.S. (+)	Nov. 8, 1913 ..	8	1	23	4	3	12	6	7	10	2	3	16
12	F. R. (+)	Aug. 21, 1916 ..	5	4	10	1	0	7	3	4	25	2	4	12
13	G. D. (+)	April 3, 1916 ..	5	8	28	1	4	24	3	9	7	2	4	13
14	A. N. ..	Aug. 15, 1913 ..	8	4	16	2	7	23	5	5	3	2	5	2
15	A. C. (+)	April 21, 1913 ..	8	8	10	3	2	26	5	8	27	2	6	1
16	L. T. ..	Nov. 11, 1913 ..	8	1	20	2	4	14	4	11	14	2	7	0
17	G. M. ..	Feb. 2, 1915 ..	6	10	29	1	1	19	3	11	16	2	9	17
18	P. B. (+)	July 13, 1916 ..	5	5	18	1	1	15	3	9	3	2	9	18
19	M. L. ..	April 26, 1915 ..	5	8	6	0	10	29	3	8	22	2	9	28
20	M. Z. ..	Jan. 16, 1909 ..	12	11	15	7	10	24	10	11	24	3	1	0
21	J. C. (+)	Feb. 24, 1912 ..	9	10	7	4	4	23	6	7	21	3	2	28
22	M. C. ..	April 14, 1913 ..	8	8	17	2	11	24	7	2	2	4	2	8

This gives the age when isolated, the age when suspicious signs appeared, and the period of isolation, and it shows that from several months to several years may elapse after contact or association with lepers before suspicious or definite signs of leprosy develop.

Table 5 is still more instructive. It gives the data regarding 308 children born and living in association with their leper parents and others at Culion classed according to their ages and condition, whether bacteriologically positive (7·79 per cent.), clinically anaesthetic lepers (6·4 per cent.), suspicious (18·8 per cent.), or entirely negative (66·8 per cent.), thus showing that 14·2 per cent. were lepers and 18·8 per cent. more showed suspicious signs of the disease. As these figures include all the young children, many of whom may be in the incubation period of the disease, the following percentages of definite infection at different ages are also given, namely, 36·8 per cent. in children of 10 to 13 years of age, 12 per cent. in those of 5 to 9 years, and only 2 per cent. in those under 5 years, many of whom are certain to develop the disease later even if now isolated, as shown by the data in the first table. The well-known great susceptibility of children to leprosy is once more brought out by the above data and is emphasized by figures of the first table, which shows that no less than 15 children isolated between the ages of 11 months and 4 years old developed the disease within 8 months to 4 years after separation from their infected parents.

TABLE 5.—*Incidence of Leprosy in the Children of Leper Parents.*

Age in years.	Children examined.			Positive lepers.				Clinical lepers.			
	Males.	Fe-males.	Total.	Males.	Fe-males.	Total.		Males.	Fe-males.	Total.	
							per cent.				per cent.
Under 1 ..	15	17	32	—	—	—	—	—	—	—	—
1	25	17	42	—	—	—	—	—	—	—	—
2	13	15	28	—	—	—	—	—	1	1	3·57
3	25	15	40	1	—	1	2·5	—	—	—	—
4	19	20	39	1	2	3	7·69	5	2	7	17·9
5	9	8	17	1	1	2	11·76	—	—	—	—
6	15	21	36	1	1	2	5·33	1	3	4	11
7	12	12	24	2	1	3	12·50	1	1	2	8·33
8	6	16	22	—	2	2	9·09	1	3	4	18
9	6	3	9	3	1	4	44·44	—	—	—	—
10	5	3	8	2	1	3	37·50	—	—	—	—
11	—	4	4	—	1	1	25	—	—	—	—
12 ..	1	4	5	—	2	2	40	1	1	2	40
13	2	—	2	1	—	1	50	—	—	—	—
Total ..	153	155	308	12	12	24	7·79	9	11	20	6·4

Age in years.	Suspicious.				Negatives.			
	Males.	Females.	Total.		Males.	Females.	Total.	
				per cent.				per cent.
Under 1..	—	—	—	—	15	17	32	100
1 ..	3	3	6	11·904	22	14	36	85·71
2 ..	2	2	4	14·27	11	12	23	82·14
3 ..	9	4	13	32·5	15	11	26	65
4 ..	5	6	11	28·2	9	9	18	46·15
5 ..	2	4	6	35·29	6	3	9	52·94
6 ..	7	3	10	27·7	6	14	20	55·55
7 ..	1	—	1	4·17	8	10	18	75
8 ..	1	4	5	22·72	4	7	11	50
9 ..	—	—	—	—	3	2	5	55·55
10 ..	1	1	2	25	2	1	3	37·5
11 ..	—	—	—	—	—	3	3	75
12 ..	—	—	—	—	—	1	1	20
13 ..	—	—	—	—	1	—	1	50
Total	31	27	58	18·8	102	104	206	66·8

It is to be hoped that these terrible figures will hasten the time when it will universally be considered to be criminally negligent to allow healthy children to live in the same houses as, or come into contact with, actual lepers.

L. R.

ARIAZZI (A.) & PICO (C. E.). **Sobre la reacción de Sachs y Georgi. Estudio comparativo con la reacción Wassermann en diversas afecciones y especialmente en la lepra.**—*Rev. Inst. Bacteriolog.* 1920. May. Vol. 2. No. 5. pp. 721–728.

A comparative trial of the Sachs-Georgi and Wassermann reactions in which in 390 of 408 serums tested the two reactions were concordant, a percentage of 95·4. In the 65 leprosy cases the Wassermann was positive in 21, the Sachs-Georgi in 19.

A. G. B.

PERKINS (Granville A.). **Manufacture of Certain Drugs for the Treatment of Leprosy.**—*Philippine Jl. Sci.* 1922. July. Vol. 21. No. 1. pp. 1–14. With 1 plate.

This paper gives a valuable account of the preparation and chemical constitution of derivatives of chaulmoogra oil now being used for injection in the improved treatment of leprosy; it is written from the chemist's standpoint, so is mainly technical. After reference to the widely distributed varieties of Hydnocarpus oils, which contain the same active unsaturated fatty acids as true chaulmoogra oil derived from the *Taraktogenos kurzii* of India, the history of the recent advances, familiar to readers of this *Bulletin*, is dealt with, including the views of WALKER and SWEENEY that the fatty acids of chaulmoogra oil have a direct destructive effect on the lepra bacilli, and of ROGERS that unsaturated fatty acids as a whole are effective in leprosy even when without a direct action on acid-fast bacilli *in vitro*. The various preparations of chaulmoogra oil in recent use are next described, including MERCADO's formula for intramuscular injections of the whole oil, chaulmoogra ethyl esters, for some time used as "antileprol" and recently revived by DEAN and HOLLMAN in Hawaii and by MUIR in his E.C.C.O. mixture for similar use, sodium gynocardate A of ROGERS given intravenously, and sodium and ethyl ester morrhuates of the same worker; such details of the manufacture of each as are of value to chemists are given, especially of the preparation on a large scale of ethyl ester chaulmoogrates, with an illustration of the apparatus used. All the above preparations are now being tested clinically on a large scale at the Culion Colony with its 5,000 lepers, ethyl ester intramuscularly being the main routine treatment, and the results of this crucial trial will be awaited with great interest. In conclusion the writer states that the "success recently obtained in the treatment of leprosy and tuberculosis with drugs derived from certain oils is encouraging, not only in itself but also in the prospect for improvement that it promises. If WALKER's idea of the absorption of toxic fatty substances by acid-fast bacilli is correct, it should be easy to make in the laboratory a much more effective drug by properly combining a toxic element like arsenic or antimony with a fatty acid. If ROGERS's idea of the efficacy of unsaturation in general proves to be correct, oils may be used that are much more unsaturated than chaulmoogra oil."

L. R.

DEAN (Arthur L.). & WRENSHALL (Richard). **Preparation of Chaulmoogra Oil Derivatives for the Treatment of Leprosy.**—*Public Health Rep.* 1922. June 9. Vol. 37. No. 23. pp. 1395–1399. With 1 text fig.

The method used in Hawaii in making ethyl esters of chaulmoogric fatty acids from both Hydnocarpus and Taraktogenos oils of a similar chemical composition is described. They are distinguished from all others by their power of rotating the plane of polarized light, the more valuable oils showing specific rotations around + 50°, which is a reliable test of the quality of the oils irrespective of their appearance. For the details the paper must be consulted.

L. R.

MORROW (Howard), WALKER (Ernest L.) & MILLER (Hiram E.). **Experience with Chaulmoogra Oil Derivatives in Treatment of Leprosy.**—*Jl. Amer. Med. Assoc.* 1922. Aug. 5. Vol. 79. No. 6. pp. 434–439. With 10 figs.

The writers report their experience of the treatment of advanced lepers in the San Francisco hospital, which was at variance with the expectations they had formed from recent reports from other countries, a brief history of which they give. They began the treatment of 10 nodular, 6 maculoanaesthetic and 5 mixed cases in August, 1920, the average duration of the disease being 4½ years and varying from 2 months to 13 years, and the period of isolation averaging 3 years; weekly intramuscular injections of ethyl ester chaulmoograte were given. Laboratory investigations showed that butyl and propyl esters produced much less local pain, while in two cases treated with these preparations alone the results were as good as in the others. The duration of the treatment was 3 to 18 months. The results were as follows: 1 boy died of leprosy and 1 man of 71 of pneumonia after the leprosy was better; 3 advanced cases got worse; 9 showed no improvement; 2 cases of moderate severity improved markedly, and 3 similar cases improved slightly; 2 early cases absconded after three months' treatment.

In view of these poor results one of the authors visited Hawaii and saw all the cases there, including the early ones in the Kalihi hospital, and ascertained that between 1918 and July, 1921, 150 patients had been paroled, of whom 10 at least had died and a few had gone to other parts of the islands, while 20, or 8 per cent., had returned to the hospital for treatment of recurrences of the disease. Weekly injections are now being given to paroled cases for two years. At the Molokai settlement, during 1921, 300 of the 452 patients were treated with the ethyl ester, but, as no cases have been sent to Molokai since 1919, there are very few early cases among them. Few, if any, of the 300 patients yet show indications of early parole, although Dr. GOODHUE hopes to see many of the milder cases cured. HEISER and many others agree that the esters are by far the best of the present chaulmoogra oil treatments and will probably cure early cases after years of treatment and also a very small percentage of a fairly advanced stage. In the San Francisco hospital the aged and advanced cases proved unfavourable, but in the few early cases the authors were satisfied that the remedy is of great value. It should, however, be continued for three years in mild and much longer in advanced cases.

L. R.

FOWLER (Henry). **The Modern Treatment of Leprosy.**—*China Med. Jl.* 1922. Mar. Vol. 36. No. 2. pp. 115–118. With 4 text figs.

Although over-optimistic statements have been made in the lay press regarding the ethyl ester chaulmoograte treatment, yet in properly selected cases, especially in the young and those in the early stages, clinical improvement is rapid and striking, but the results are less favourable in older persons and cases of long duration. It cannot yet be said whether actual cures will result, and in arrested cases some relapses must be expected, as in tuberculosis. Up to the present 8 per cent. of those paroled in Hawaii have relapsed and returned for further treatment. Apparent cures have been obtained in a considerable number of cases; time is required to say if they are permanent or not, but a hopeful advance has been made. Supplies of the drug are now being made at Calcutta, at the Government laboratories at Seoul, at Honolulu (and in the Philippines), and at the Pekin Union Medical College in China. An English and an American firm have made efficient supplies, but their cost is prohibitive for hospital use on a large scale.

L. R.

BLOCH & BOUVELOT. **Emploi de l'huile de chaulmoogra et de ses dérivés dans le traitement de la lèpre.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. Apr.-May-June. Vol. 19. No. 2. pp. 181-188.

The authors first refer to the early favourable results obtained with the ethyl ester of chaulmoogra oil in the form of "antileprol" by BICCARDI (*Lepra* 1911, p. 211), by SERRA (*Lepra* 1913, p. 63), and by ENGEL BEY mainly by oral administration, and to the work of ROGERS with gynocardates and sodium morrhuate, all previous to the work of DEAN and HOLLMANN, and then describe the well-known method of preparation [see the paper of DEAN & WRENSHALL above].

The present writers have given weekly intramuscular injections of from 1 to 5 cc. of the ethyl ester and found it especially efficacious against nodular cases. They have also obtained remarkable results in the usually resistant nerve form, and they noted the usual febrile and local reactions succeeded by retrogression and absorption of the lesions, which also follows direct injection of the remedy into the nodules themselves. In about 10 per cent. the febrile reactions were accompanied by a fresh crop of transient raised red patches. They have obtained notable improvement in all their cases, and often cures.

L. R.

NICHOLLS (Lucius). **Treatment of Leprosy.** [Correspondence.]—*Brit. Med. Jl.* 1922. Nov. 4. p. 892.

It is pointed out that nastin and other preparations have been lauded for a time as cures of leprosy and the writer knows of medical men who have failed to get good results with gynocardates. Muir's E.C.C.O. mixture was tried for many months in the Ceylon Leper Asylum and careful records were kept, but the results were very disappointing, and he wishes to direct attention to the following points: (1) that many cases undergo a natural recovery in the early stages; (2) most of the lepers segregated in asylums are in the later stages [in India about three-fourths of asylum cases are old, mutilated, anaesthetic cases in whom no material effect from treatment is possible]; and (3) the disease waxes and wanes and natural cures are more common than is thought.

L. R.

HARPER (P.). **The Treatment and Prognosis of Leprosy.**—*Brit. Med. Jl.* 1922. July 8. pp. 39-40.

Further experience in Fiji is recorded. Good and abundant food, including milk, open-air life, gentle exercise and daily baths and amusements are advocated; while surgical measures, including exposing the length of thickened nerves and peeling the epineurium from the inflamed nerve, are of value. Among medicinal treatments he has tried: (1) tartar emetic intravenously up to totals of 43 and 46 gr. without any resulting improvement; (2) ethyl ester chaulmoogrates intramuscularly, which he found expensive, very painful and not as effective as 3 and 5 below; (3) sodium hydnocarpate orally and intravenously, which is better than the foregoing, but not so good as method 5; (4) HEISER's chaulmoogra oil formula intramuscularly, which is painful and causes fibrous degeneration of the muscles, but is nevertheless valuable; and (5) intravenous injections of crude chaulmoogra oil sterilized by heat given at blood temperature in doses of 5 to 15 minims one to three times daily, with two weeks' rest after four weeks' treatment. This is continued until a reaction occurs, during which treatment is stopped, febrile and local reactions being followed by improvement, but the treatment must be continued for years. In early and mild cases there is fair hope of cure or arrest of the disease. Most lepers die of intercurrent diseases, the causes of death in 157 cases at Makogai having been: tuberculosis 42, septic infection 31, nephritis 18, leprosy 14, exhaustion 5, tetanus 4, senility 3, pneumonia 3, dysentery 3, suicide 3, amyloid disease 2, and 20 different intercurrent diseases in the remaining 24 cases.

L. R.

ROBINEAU. **Le traitement de la lèpre dans les léproseries d'Ebolowa (Yedang-Ngalan) au Cameroun.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Jan.-Feb.-Mar.-Apr. Vol. 20. No. 1. pp. 22-36.

After mentioning some of the older remedies for leprosy, the writer gives tables showing the results of treatment of a number of cases with: (1) intramuscular injections of 1 to 2 cc. of chaulmoogra oil, 50 cases being treated without febrile reactions or abscesses; after three months the results were encouraging; (2) intramuscular injection of the following chaulmoogra-alcohol-ether mixture—chaulmoogra oil 150 gm., 95 per cent. alcohol 30 gm., and sulphuric ether 35 gm., the mixture being passed through filter-paper and protected from evaporation. Of 43 macular cases treated for four months, 33, or 76·7 per cent., showed notable improvement and five no change, but the supply ran out just as the results became interesting. Arrhenal-atoxyl intramuscularly was next tried, as a case of sleeping-sickness in a leper had shown improvement in the leprotic lesions under this treatment. Weekly injections of 0·1 gm. atoxyl and 0·05 gm. of arrhenal in 2 cc. water were given in 77 lepers, from 20 to 50 injections in each without any ocular reaction or intoxication, and they conclude by expressing the hope that this method will give satisfactory results. Later, they also used intramuscular injections of d'aiouni-eucalyptol,* but as all three lines of treatment were used one after the other in the great majority of the cases shown in the tables, many of which improved in variable degrees, it is not possible to draw any safe conclusions regarding any one of them, although they think the value of the chaulmoogra oil preparation seems to be demonstrated.

L. R.

---

* Aiouni is chaulmoogra oil prepared by Alf. Cousin, at Lausanne.

HASSON (James). **Traitement de la lèpre tubereuse par l'aminoarseno-phenol (132).**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Oct. 26. 3rd Ser. Year 38. No. 28. pp. 1356–1361.

This arsenical preparation, which is called eparseno for short, was given intramuscularly in large doses to 17 nodular lepers, 15 of whom had previously been treated by injections of various chaulmoogra oil preparations. The cases were seen at Alexandria and came from Egypt and the Sudan, and the injections were made in the buttock in both hospital and out-patients, one ampoule daily during the first week and then two daily for 10 to 15 days according to the tolerance of the patients ; after an interval of 10 to 15 days a second series of two to three ampoules daily for seven to eight days, careful observations being made on the urinary elimination and the general tolerance to arsenic. The results showed a sensible amelioration by the third week, the lesions became reduced and disappeared usually by the fifth to sixth week, only two cases resisting the treatment up to the tenth week, when four series of 10 ampoules had been injected. In anaesthetic cases the nerve symptoms only receded very slowly, but in a nodular case in a child of 11 years the lesions disappeared completely in one month. After the first series of injections the lesions were often aggravated with congestive reactions and even ulceration with a slight rise of temperature, but this was followed by amelioration and recovery of sleep and appetite. The complement fixation test was positive with antigens made from lepromes before the treatment, but generally negative after, sometimes as early as the third week. He concludes that the results of the intensive treatment by this drug were better than those obtained with chaulmoogra oil preparations.

L. R.

GOUGEROT. **Traitement de la lèpre par l'aminoarsenophenol (eparseno).** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Nov. 2. 3rd Ser. Year 38. No. 29. pp. 1379–1382.

Three cases of leprosy treated with this drug are reported :—

1. A South American, aged 37, with nodular leprosy for 12 years unsuccessfully treated by Hollmann and Dean's method. He was given eparseno for two months in weekly doses of 1, 1·5, 2 and 4 cc., the first three injections being followed by febrile and local reactions and subsequently by progressive slow lessening and absorption of the lesions. After a rest of 15 days a second course was given and all the lesions completely disappeared, leaving only pigmented macules.
2. Received 17 cc. in 11 injections given twice a week, when arsenical vesicles appeared and later boils, but the leprotic lesions disappeared after eight injections, and a clinical cure resulted.
3. A patient, aged 59, with symptoms beginning in May, 1919, and continuing in spite of chaulmoogra oil treatment. Eparseno was injected in 1 cc. doses every other day, and as pains increased the same dose was given every third or fourth day up to a total of 12 cc., when the lepromes were already half absorbed ; the treatment was resumed after eight days' rest up to 19 injections, when the lepromes were absorbed, only pigmentation remaining. These three cases, taken with the 17 cases of HASSON (see above) and the regularity of the reactions and results make him hopeful that eparseno will rapidly efface the lesions of leprosy.

L. R.

CAWSTON (F. G.). **Antimony and Sulphur in the Treatment of Lepers.** —*Jl. Trop. Med. & Hyg.* 1922. Nov. 1. Vol. 25. No. 21. pp. 345–346.

In the Basuto leper asylum colloidal antimony and sulphur have been tried with some improvement in the temperature of two acute cases, but a series of 11 injections containing 8½ gr. of tartar emetic gave disappointing results. MACFIE, on the Gold Coast, treated one leper for 7½ months with injections of oscal stibium totalling 52 cc. with considerable improvement. Sulphur counteracts the metallic poisoning caused by colloidal antimony alone.

L. R.

BARBER (H. W.). **Case of Nodular Leprosy.**—*Proc. Roy. Soc. Med.* (Sect. of Dermat.) 1922. Sept. Vol. 15. No. 11. p. 48.

ITO (Shiro). **[Efficacy of the Ester of Chaulmoogra Oil in Leprosy.]**—*Iji-Shimbun* (*Med. News*). 1922. Apr. No. 1092. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2. No. 10. p. 297.]

LEGER (Marcel) & NOGUE (Maurice). **Mycose à *Scopulariopsis* chez deux malades ayant des lésions cutanées ràppelant la lèpre.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 654–661. With 3 text figs.

PARRA (Ricardo F.). **Tratamiento de la lepra en Agua de Dios (Nota preliminar).**—*Repert. de Med. y Cirug.* 1922. Mar. Vol. 13. No. 6. (No. 150) pp. 306–311.

ROGERS (Leonard). **The Spread, Probable Mode of Infection, and Prophylaxis of Leprosy.**—*China Med. Jl.* 1922. Nov. Vol. 36. No. 6. pp. 474–486.

YORKE (Warrington) & ADLER (S.). **Note on a Case of Leprosy.**—*Ann. Trop. Med. & Parasit.* 1921. Sept. 30. Vol. 15. No. 3. p. 269. With 1 plate.

REVIEWS AND NOTICES.

ROGER (G. H.). **Physiologie normale et pathologique du foie.**—398 pp. With 16 charts in text. 1922. Paris: Masson et Cie, 120, Boulevard Saint-Germain. [Price 22 francs.]

The author is well known by his numerous published researches on the liver, and the present volume is a welcome one. It treats of the numerous functions assigned to the organ, in reference to bile formation and metabolism. This is followed in each case by a description of deviations from the normal. Thus, disorders of the circulation follow on a description of the normal blood flow through it, jaundice of various kinds follows the physiology of bile formation, diabetes—the account we have of its glycogenic function—and so forth. The book is not written from the point of view of the student of tropical diseases, but much of such questions is naturally included, and the whole is eminently readable. The book unfortunately lacks an index, and would have been much more valuable had a bibliography been appended as well. The only literature quoted consists of M. Roger's own writings. It is interesting to note how much we are indebted to French writers, and their names, from Claude BERNARD onwards, are frequently alluded to but without any reference to their publications. This limitation narrows considerably the outlook of the book. To take an instance, one which specially appeals to the reviewer, the influence of the liver on blood-coagulation; the data presented are nearly all due to the work of the author's French colleagues. Without denying the importance of their point of view, the subject would have been much more complete, and probably the conclusions would have been different, if the recent work of American and English investigators, which has seriously questioned whether the liver is really responsible for the elaboration of antithrombin and other theoretical substances, had been also considered.

W. D. Halliburton.

NICOLLE (M.) & MAGROU (J.). **Les maladies parasitaires des plantes (infestation—infection).**—199 pp. 1922. Paris: Masson et Cie, 120, Boulevard Saint-Germain. [Price 8 francs net.]

This little book is planned on somewhat original lines with the expressed purpose of providing medical pathologists and parasitologists with a general survey of pathological processes in plants. The need for a knowledge of the parasitic diseases of higher animals is already recognized by pathologists. To acquire a wide outlook on fundamental problems of virulence, immunity, reaction to infection, and the like, the authors hold that it is impossible to neglect the study of the diseases of lower animals and above all of plants, and they declare " Pas de Médecine générale, si l'on ignore ce qui se passe dans le monde végétale."

The work is divided into sections dealing with the diseases of plants due to insects, mites, and nematodes (44 pp.); to phanerogams (12 pp.); to thallophytes (55 pp.); and to bacteria (31 pp.); besides a general survey of 24 pp. at the end. Obviously within such narrow limits of space it is not possible to present more than the barest outline of the subject. From the mass of material available only such cases have been selected as are specially important or instructive in illustrating pathological processes in plants. The characters of the parasites are but incidentally touched on, symptoms and mechanism of infection are more fully discussed. Each section terminates with a survey of the processes of parasitic action within the group (penetration, infection, toxic action, virulence, and the like), resistance of the host, influence of external conditions, and general outline of treatment.

The final section seeks amongst the variety of appearances the few fundamental processes. This part of the book suffers more than the rest from over-condensation and a certain timidity of presentation which results from an insufficient discussion of the evidence. Thus the case for toxic action on the tissues at a distance from the seat of the parasitic lesion is left somewhat hypothetical, though it is fully proven in, at any rate, a certain number of instances. Much more is known regarding the means of resistance to parasitic attack made use of by plants than the short generalized statement on page 187 would imply, though we may agree that most of the causes of natural immunity are still obscure. There is scarcely any mention of the very important work of recent years in the Mendelian inheritance of resistance and susceptibility to disease in plants, though the subject cannot but have a bearing on the nature of immunity. The extraordinarily close relationship between the environment, especially temperature and humidity, and certain cryptogamic diseases of plants is only hinted at, though it is of much significance in comparative pathology. The plan of this section of the book provides an excellent framework for the discussion of most of the features of disease in plants likely to be of interest to comparative pathologists, and it is greatly to be regretted that the self-imposed limitations of space have prevented an adequate presentation of the subject, which one feels the authors could so well have accomplished.

The descriptive part of the work has been clearly and carefully written and shows a commendable caution in accepting only fully substantiated work in almost all cases. Errors of fact are rare, which in view of the wide field covered, the few good modern textbooks of plant diseases, and the great strides made in our knowledge of such diseases in recent years is no mean feat. Whether so brief an outline can really fulfil the authors' purpose is doubtful, but at least it should stimulate interest in the pathological processes of plants amongst pathologists in other fields, and perhaps encourage them to acquire for themselves a further knowledge of the subject.

E. J. Butler.

STANNUS (H. S.). **The Wayao of Nyasaland.**—Reprinted from *Harvard African Studies*, Vol. III. Varia Africana III. pp. 229–372. With 23 plates. Peabody Museum of Harvard University, Cambridge, Mass., U.S.A.

The author of this fine ethnological study was stationed for several years at Zomba in the Shiré Highlands of Nyasaland, and he gives us here a methodical record of his own observations of the natives of that vicinity—the Amachinga Yao, a section of the Wayao, a Bantu-speaking people whose cradle is uncertain. His ample survey of these natives includes the life history of the individual with all its critical formalities ; their complicate family relationships ; their formidable catalogue of diseases, and their treatment ; their poisons, witchcraft, ordeals, magic, and divinations ; their religious beliefs and their superstitions ; their proverbs and stories ; their housing, utensils, foodstuffs, and clothing ; their decorative art, musical instruments, songs and dances ; their warfare, hunting, fishing, and their traps ; and their games and amusements. We cannot here deal with the matter of the author's studies, but must applaud the unprejudiced spirit in which they have been presented. For it is evident that the indigenous customs and practices are here regarded, not as crude abominations to be effaced by all the apparatus of theology, but as a native growth more or less adapted to the circumstances, and not so inconceivably remote from the standards of Christian ethic as to be utterly and entirely incapable of some closer adjustment to those standards. The author also, like observers elsewhere, sees the danger to the younger generation of a mere doctrinal emancipation from the old traditions and restraints.

The book is well printed and finely illustrated, but in its present form, as a reprint, it suffers badly from the complete absence of all the usual investure of a book, namely, a title-page, a table of contents, a sufficient explanation of the plates, an index, and the subdivision of the text into chapters.

A. Alcock.

DAVID. **Vade-Mecum à l'Usage des Infirmiers et des Assistants Médicaux-Indigènes.**—214 pp., interleaved. 1922. Vromant & Co., Imprimeurs-Editeurs, 3, rue de la Chapelle, Bruxelles. [Price not stated.]

This little book is meant for a class of men corresponding to the Indian Hospital Assistants. It is not intended to be a substitute for teaching, but is to be used as a notebook for ready reference to things within the knowledge and competence of the professional subordinate and intermediary between the European doctor and the native patient. Written in simple language, and furnished with a sufficient index, it admirably answers its purpose. A few pages of introduction impart the essence of the Hippocratic tradition. Then follow in orderly arrangement the elementary facts of anatomy and physiology; and then comes a general survey of the causes of disease and the meaning of infection, the management and observation of the sick, the various methods of administering remedies, the principal remedies in common use, the special features of the commoner diseases, and some elements of hygiene and prophylaxis. Minor surgery in all its aspects and apparatus and exigencies comes next, occupying nearly a third of the book. Then there is a section on certain specific diseases and infections particularly rife among the inhabitants of Congo, and, finally, a few pages on obstetrics and the hygiene of infancy. The material is all good, but perhaps its arrangement could be improved.

A. Alcock.

PEKING. **Contributions from the Peking Union Medical College, Peking, China.** 1921. Vol. 1. pp. vi + 316. With numerous plates & figures.

The contents of this collection include papers by FAUST on the Parasites of Vertebrates, on the Intestinal Parasites of Man in the Central Yangtze Valley, on the Excretory System of *Cercaria pekinensis*, on the Schistosome Problem, on South African Larval Trematodes, and on the Trichomonas of Man and of the Guinea-pig; papers by MAXWELL on Intestinal Parasitism in South Fukien and on Filariasis in China; a paper by HAN and YOUNG on Agglutination following injections of T.A.B. vaccine, and two serological papers on kala azar by SIA and HSIEN WU; a paper on experiments with toxicity of antimony by KORNS; papers on analytical investigations of Chinese foods, by EMBREY and TSAN CHING WANG; several descriptive papers on details of human and comparative anatomy; a paper on the bacteriology of smears from eye cases by PA TA CHIH; and several papers on clinical and historical subjects. All of the papers have already been published in well-known journals.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 3.

YAWS.

SPITTEL (R. L.). **Parangi.**—*Jl. Ceylon Branch of the Brit. Med. Assoc.* 1922. May–Aug. Vol. 19. Pt. 2. pp. 1–14.

This is a complete account, written by a master of his subject, of yaws, or parangi, as it is called in Ceylon (= foreigner, signifying its extraneous origin); the author admits that it contains little that is new, but he finds the text-book accounts unsatisfactory.

In a series of 32 cases the primary sore was on the foot or ankle in 18; only once in some hundreds of cases has he seen it on the penis. After full consideration of the primary and secondary stage, he comes to the quiescent period, which usually lasts from 4 to 12 years before tertiary symptoms appear. He has known instances of latent periods of 25 and 30 years and calls attention to the risk of speaking of the cure of such a disease after a relatively short observation period.

The most valuable part of his paper is that which concerns the tertiary stage, for there is a general impression that the lesions of this stage may be, or are, due to syphilis.

Tertiary yaws closely simulates tertiary syphilis and like it has two kinds of manifestations: (1) gummata; (2) fibroid induration; each the result of proliferative inflammation in response to a slow persistent biological stimulus. If there is manifest degenerative change the result is gumma, if not, fibroid induration. The clinical manifestations are gummatous infiltration (localized or diffuse in bones, fasciae, etc.), and serpiginous or lupoid ulceration of the skin and subcutaneous tissues (nodular cutaneous framboeside). The special characters of the tertiary eruptions are then considered.

(8836) Wt.P.5/115 - 1,500 3/23 Harrow G.75 N

Bones.—Gummata or nodes are as common in yaws as in syphilis. Sometimes they break down, leaving banked indolent ulcers, followed it may be by superficial caries or necrosis of bone. In the long bones of the hands and feet the gummatous process is central and the condition suggests tuberculous dactylitis. Diffuse infiltration leading to osteo-sclerosis with bowing and deformity is very common in the tibia, less so in the fibula and ulna. Yaws, Spittel says, affects bones more extensively than does syphilis, especially those near the surface; he instances the tibia, malleoli, humoral condyles, radius and ulna, and the sites of muscular origins and insertions such as the epicondylar ridges of the humerus and the posterior surface of the os calcis. Other sites mentioned are the spine of the scapula and the clavicle, especially at the acromial end. Gummatous infiltration of the nose and palate produces all degrees of destruction from yielding of the septum to extreme forms of "gangosa" with hideous deformity.

Gummata of the Soft Parts.—Skin, subcutaneous tissues and fasciae are most frequently affected. The spirochaete seems to have a predilection for connective tissues. The infiltration may persist for months and then either become absorbed or fibrous, or break down leaving a punched-out ulcer. Secondary infection is common.

Nodular cutaneous framboeside.—Any part may be affected, but the favourite sites are the back, buttocks and limbs. Beginning in a papule which becomes a shallow ulcer the process of spreading and healing goes on for a prolonged time. "A nodule may take half to one year to break down, an area the size of the palm may take a year to be covered, fifteen years may elapse for the condition to spread from arm to forearm." In this it is unlike syphilis, but strongly resembles a skin tuberculide. The scarring and contraction of these lupoid framboesides often lead to crippling deformities.

After reference to juxta-articular nodes about the elbows, knees, hips and ankles, which are common in yaws but not in syphilis, and the rare condition of tertiary erythema, occurring as a rule in the sock area, the author comes to the *joints.* Synovitis and peri-articular inflammation are often seen. Joint movement may be limited, owing to various causes. Infiltrations of fasciae, tendon attachments and bursae are frequent.

The author has never met with definite nervous symptoms in yaws, but he thinks that the nervous system is affected mildly and transitorily in some cases. He knows no instance of congenital yaws; abortions do not take place even when the mother is heavily infected.

The *diagnosis* has to be made from syphilis and here laboratory tests give no help. We have to rely on the history of the case and the physical signs. In tertiary manifestations, which may just as well be syphilitic as framboesial, the type of patient is of assistance. The victim of yaws is a guilèless villager not much the worse for his disease; the subject of syphilis is a more sophisticated town-dweller with health undermined. The lesions of yaws are more chronic and less actively destructive than those of syphilis. Syphilis usually does in a few weeks what yaws takes months or even years to do (nasal destruction is perhaps an exception). But apart from these the history is often the deciding factor, as the author illustrates by example.

He gives the following summary of differences between the two diseases :—

Parangi.	*Syphilis.*
1. Not congenital. No reciprocal immunity.	1. Congenital.
2. *Primary sore* extra-genital.	2. *Primary sore* usually genital.
3. *Secondary stage :* (*a*) Typical yaw pathognomonic. Furfaraceous desquamation and plantar lesions also characteristic. (*b*) Mucous membranes unaffected. (*c*) Itching common. (*d*) Alopecia unknown. (*e*) Eyes unaffected.	3. *Secondary stage :* (*a*) Syphilis seldom imitates these. (*b*) Mucous membranes often affected. (*c*) Itching rare. (*d*) Alopecia may occur. (*e*) Iritis common ; choroiditis and retinitis rare.
4. *Tertiary stage :* (*a*) Visceral lesions rare if they occur at all. (*b*) Nervous system scarcely ever seriously affected. (*c*) Blood vessels.—Perivascular infiltration and endothelial proliferation of intima not generalized as in syphilis.	4. *Tertiary stage :* (*a*) Visceral lesions occur, *e g.*, pericellular cirrhosis, gummata of liver, testis, kidney (*b*) Nervous system prone to infection ; myelitis, cranial nerve palsies, gumma of brain and spinal cord, tabes, G.P.I. (*c*) Endarteritis obliterans, thrombosis of cerebral arteries, arteriosclerosis, and aneurysm liable to occur.
5. Parangi is better resisted than syphilis : shown by—(*a*) slight constitutional disturbance ; (*b*) greater exuberance of eruption, scars more keloidal : (*c*) slower development of lesions.	5. Syphilis makes more serious wreck of the constitution, affecting more vital structures ; while parangi chiefly attacks connective tissues.
6. Does not respond well to mercury.	6. Responds well to mercury.

Treatment.—The author agrees with all observers that secondary lesions, recent tertiary lesions and lupoid ulceration yield promptly to salvarsan, but the response of long-standing ulcerations is often disappointing. Cauterizing or curetting may be necessary. Of chronic ulcers he writes :—

> " Stimulating applications may be required, such as resin and turpentine ointments or Friar's balsam. Should these fail, firm pressure with a Martin's bandage worn all day and removed at night, and scraping or undercutting of the edges will establish conditions favourable to Thiersch grafting. The dressing I have found most useful after grafting relatively unhealthy discharging areas is one of perforated oiled-silk covered with gauze soaked in half-strength normal saline and firmly bandaged down. The dressing is kept continually soaked in the solution. Once or twice in twenty-four hours the gauze is changed ; but the oiled-silk is not touched for four or five days, when it will be found the grafts have taken well. After this, gauze soaked in half strength lotio rubra is applied over the oiled silk. This dressing is the best I know for any granulating surface, whether grafted or not."

Facial deformities afford much scope for rhinoplasty. As to neo-salvarsan the author gives 0·6 to 0·75 gm. to average males by intravenous injection at intervals of a week or ten days. The rule should be six injections in every case. After each injection the temperature is recorded till it is normal, the urine examined, and the skin carefully inspected for the least sign of irritation. No injection should be repeated till the patient is quite himself again. He gives iodides as well both by mouth and intravenously, just as mercury is nowadays given with salvarsan for syphilis.

He does not believe that a campaign to eradicate yaws can be conducted by inviting the natives to attend at central injecting stations. They must be visited in their homes, each series of villages four to six times. Such a scheme is now in operation in Ceylon. The author has seen many clinical recurrences within six months to six years of two to six large injections of both "606" and "914," in addition to courses of mercury and iodides. While not minimizing the difficulties, he looks forward to the ultimate extermination of yaws in Ceylon.

A. G. B.

MOSS (W. L.) & BIGELOW (G. H.). **Yaws. An Analysis of 1,046 Cases in the Dominican Republic.**—*Bull. Johns Hopkins Hosp.* 1922. Feb. Vol. 33. No. 372. pp. 43–55. With 8 plates of 30 photographs.

The authors, who are respectively Assistant Professor and Instructor in Preventive Medicine and Hygiene at the Harvard Medical School, visited Santo Domingo in 1920 by official request. Their report, which is presented in abstract, is a valuable one and is excellently illustrated. They begin with a sketch of the history of the island from 1492, when Columbus discovered it, to 1916, when the military occupation by the United States took place. External war and internal revolution have prevented the development of the island's resources and have occasioned neglect of education and sanitation. The following classification and abbreviations are used in the author's tables :—

" M. Madre buba, mother yaw, primary lesion.
" B'. Florid secondary eruption of granulomata. Early secondary stage.
" B. Sparse recurring secondary granulomata. Late secondary stage.
" C. Clavus. Late lesions on the soles. Late secondary stage.
" P. Palmar lesions. Late lesions on the palms. Late secondary stage.
" G. 'Gomma.' Tertiary stage.
" H. History of yaws. No active lesions present. Quiescent."

Primary Stage.—In 64 cases a primary lesion was present, and in 54 of these secondary lesions were present as well. With the object of elucidating the mode of transmission, in 969 cases the location of the madre was determined either by history, observation of the lesion, or scar (in 71 per cent. the scar was present) ; a table shows that in 83 per cent. the lesion was on the lower extremities, and in only 1 per cent. on the genitalia. Sexual transmission was thus excluded. Hereditary transmission was not seen. The authors think that the distribution of the madre excludes insect bite as the cause. An analysis of the location of the primary lesion on the lower extremities revealed that of the 803 no less than 705 were below the knee, which in a bare-legged population suggests trauma. The 705 lesions were then classed according as they were anterior, posterior, external or internal, and it was disclosed that the anterior led by a large majority, followed by the external surface, and that the posterior was easily last. This disposition is considered to correspond to exposure to minor traumata. The conclusion is not incompatible with the view that insects may be vectors of the virus.

Secondary Stage.—During the florid secondary stage 144 patients were seen, 38 of whom still showed the primary lesion, and 37 the late lesions of the soles known as clavus. It is believed that practically all patients in Santo Domingo develop granulomata on the soles and become victims of clavus. The secondary eruption corresponded closely to the description given by CASTELLANI and CHALMERS. Only one case was seen in which mucous membrane was affected.

Clavus.—Of clavus patients in the late secondary stage there were 190. The granuloma on the sole shrinks and becomes a core, which finally drops out leaving the "nail hole"; the name clavus is also given to a honey-combed condition of the sole, and pain is characteristic of both. Fissures or cracks of the sole were occasionally seen, and these also are believed to be due to yaws. The authors were surprised at the effect of salvarsan in rejuvenating the old "moth-eaten" soles; the pain was relieved in a week and later all the old epidermis was shed, exposing healthy pink skin. There were 579 clavus cases, in 327 of which no other lesion was present.

Palmar lesions were encountered 68 times.

Studded Lesions.—Nodular lesions were observed, usually in the forearms and legs; they are thus described :—

"The individual lesion consists of a moderately hard skin nodule, 1 cm. in diameter, elevated 3 to 4 mm., not painful, unaccompanied by itching and without striking pigmentary changes until after regression, when increase of pigment may mark its former site. These nodules are thickly studded and regularly set over an area 8 to 10 cm. in diameter. The size of the area involved increases by an advancing margin consisting of an almost unbroken row of nodules. As this peripheral advance occurs, healing takes place in the center of the area. If the nodules do not ulcerate this retrogression is accompanied by desquamation of the epithelium. The nodules gradually flatten out and finally disappear, leaving no trace, or more often a circular area of increased pigmentation.

"In no case were the nodules observed to pass through a vesicular stage, but they frequently underwent ulcerative changes varying from very superficial ulceration involving only the individual nodules to extensive and deep ulceration which sometimes became confluent over large areas of the body and extended to the subcutaneous tissues. The degree and character of the resultant scarring probably depends upon the depth to which the ulceration had extended. Sometimes there remains only an increase of pigmentation, as mentioned above; sometimes the skin over the entire area involved was left thin and crinkly and in patterns like those which form on the surface of hot chocolate which has been thoroughly boiled and allowed to stand awhile. .Again, where the ulceration has extended to a greater depth there may result complete leucoderma and sometimes painful keloid."

[This seems to be the nodular cutaneous framboeside of SPITTEL's paper.]

The authors are uncertain whether these should be considered as a late secondary or tertiary manifestation. They have notes of 37 cases; the average duration of the yaws disease was 13·5 years. The lesions responded specifically to neo-salvarsan.

Tertiary Stage.—In the primary and secondary stages there is littl difficulty in distinguishing between syphilis and yaws, but at the tertiary stages there are some cases in which diagnosis is impossible; the lesions in such are periostitis of the long bones, spindle-shaped swellings of the fingers, gangosa. Other manifestations of uncertain origin were arthritic enlargement, extensive skin ulcerations and great enlargement and deformity of the hands, legs and feet. There were 79 persons in the "Gomma" group, 67 of whom presented no other lesion; the average duration of these cases was 16·3 years, but in 10 cases the disease had existed only two years or less. [The authors do not say whether natives suffering from undoubted syphilis were seen.]

Latent Yaws.—The authors include in this series 127 persons who had no active lesions and in most instances had scars, doubting whether spontaneous cure occurs in any considerable proportion. In 33 of them the primary lesion had developed within two years of their application for treatment, so that the majority were probably in a latent period following the early secondary eruption. They were therefore fit subjects for treatment.

General Remarks.—The Wassermann test was made in 91 cases and found strongly positive in 78. The negative reactions occurred in the late secondary, the tertiary, and the latent stages. In discussing the sequence and duration of the various stages the authors draw attention to the overlapping, *e.g.*, in one case the madre buba was present with tertiary lesions. They have tabulated those cases which presented a single manifestation, arranging them according to the average age of each group.

Diagnosis.	No. of Cases.	Age.		Duration.	
		Average.	Extremes.	Average.	Extremes.
M. ..	15	6·6 yrs.	9/12–12 yrs.	2·3 mos.	1/12–7/12 yrs.
B′. ..	82	8·8 ,,	1⅓–50 ,,	12·3 ,,	1/12–7 ,,
B. ..	60	9·3 ,,	1–42 ,,	29·6 ,,	4/12–17 ,,
C. ..	327	21·6 ,,	3–68 ,,	9 yrs.	4/12–58 ,,
H. ..	127	23·8 ,,	1–80 ,,	9·7 ,,	2/12–59 ,,
P. ..	5	25 ,,	15–45 ,,	14 ,,	10–19 ,,
SL. ..	37	28·8 ,,	5–80 ,,	13·5 ,,	5/12–39 ,,
G. ..	67	29·3 ,,	3–85 ,,	16·3 ,,	7/12–59 ,,
	720				

They believe that this arrangement indicates the sequence in which the various lesions develop and it is to be observed that the average duration of the disease, with the exception of the studded lesions, follows the same orderly progression. The reader will note that the average age and average duration are calculated from the date of observation, so that the figures must be multiplied by some factor which the authors suggest should be 2.

Result of Treatment.—This section is interesting but less valuable than the rest, for the time the patients were under observation was limited and many after receiving a single treatment did not return. It suffices to say that the natives displayed the usual eagerness for injections. The earlier the stage of the disease the readier was the response to treatment.

A. G. B.

PIETER (H.). **A propos du pian dans la République Dominicaine.**—*Rev. Méd. et Hyg. Trop.* 1922. Nov.–Dec. Vol. 14. No. 6. pp. 230–235.

This article was written to supplement that of MOSS and BIGELOW, of whose work the author seems critical. Fever, he finds, is almost constant in the secondary stage; it is vesperal and more evident in the adult than in the child; it is influenced by quinine. He emphasizes the fact that yaws does not disappear of itself; the primary and secondary lesions may pass and the appearance is one of complete cure, but sooner or later come the tertiaries exposing the patient to lamentable ulcerations and deformities. He has had many patients who have relapsed 2–4 months after a total of 4·5 gm. of novarsenobenzol, and even after a second course. The popular treatment in the Republic consists of van Swieten's liquor or *agua divina* (a solution of mercuric chloride in 100 parts of alcohol and 900 of water). The patient is isolated, kept on a strict diet, and deprived of salted food. After 40–60 days he recovers and has no relapse or recurrence, or he may take the *agua divina* for a two-month period in three or four successive years. The same result is attained more quickly by mercurial injections. Pot. iod. is useful, but not indispensable. In the Dominican Republic babies are often inoculated on the third or fourth day at the umbilical wound ; the result is either lethal tetanus, or other infection, or a mild attack of yaws. The author states that in an infant whose mother is in the secondary stage of yaws such an inoculation is abortive. It should be added that the paper is quite undocumented.

A. G. B.

GUTIERREZ (Perpetuo D.). **Yaws : Its Manifestations and Treatment by Neo-Arsphenamin.**—*Arch. Dermat. & Syph.* 1922. Sept. Vol. 6. No. 3. pp. 265–287. With 21 figs.

A well illustrated paper describing the results of an investigation of yaws in a village on the shore of Manila Bay, where it is endemic in the poorer class. The figures are misleading unless it is remembered that with few exceptions only cases in the "infectious" stage were seen. It is the author's impression [certainly erroneous] that inhabitants of towns bordering on salt water harbour the disease, while inhabitants of interior towns are free. The great majority of the 257 cases in the earlier stages were children, 226, or 88 per cent. ; in many cases the disease seemed to have originated in a scabies lesion.

Of the primary lesion it need only be noted that in six cases where it was present all signs of the secondary lesions had disappeared ; these lesions required a second injection of neo-arsphenamine.

Besides the papules and nodules of the secondary stage the author describes macular lesions and "ichthyosis-like shins," which formed 3 and 2 per cent. of the secondary eruptions.

These macular eruptions are " a primary and distinct type of secondary eruption, similar to the macular eruptions of the secondary stage of syphilis. They are discrete, macular, lighter in color than the surrounding skin, and vary in size from that of the head of a match to that of a lima bean or larger. They are covered by fine furfuraceous white scales. These scales are easily detached and when a case is seen in the clinic only a few of the lesions are present on the surface. Around the follicles, however, they are closely packed, giving the appearance of a follicular lesion. Two or more of these lesions may coalesce, forming bigger patches as shown in Figure 13. These lesions remain for weeks as such, finally disappearing and leaving a white patch of skin."

The histopathology, which is described, is not dissimilar to that of frambesiform lesions.

" Closely related to this type of eruption is an eruption which we have termed, for want of a better name, ichthyosis-like shins. This is a diffuse mild keratosis not dissimilar to the skin found in persons suffering from xerodermia. The whole anterior portion of the tibia is affected, being covered with firm branny scales, white or grayish white (Fig. 16). The scales are more adherent than the scales found in the preceding type of eruption. Scattered over the surface at times are small papules. This type of eruption is not common, being found only three times in 196 cases, or in 1·53 per cent. of cases. It may be found in association with the macular, papular or nodular eruptions. We have observed it only in children."

TABLE 3.—The Relation between the Appearance of the Primary, Secondary and Tertiary Lesions.

	No. of Cases.	Percentages
Primary	10	4·63
Secondary	90	39·30
Tertiary	24	10·48
Combined Lesions :		
Primary, secondary	52	22·70
Secondary, tertiary	39	17·03
Primary, secondary, tertiary	14	6·11
Total Cases	229	

Of tertiary lesions, bone lesions, gummas, and plantar lesions or clavus are briefly described.

Of 275 cases treated with neo-arsphenamine, 0·6 gm. or less, 94·5 per cent. were well one and a half months after the last injection. In 86 cases two injections were given, in the remainder one. Ulcers and primary lesions did not improve as was expected, and tertiary lesions required more than a single injection.

A. G. B.

CLAPIER. **L'endémie pianique sur le Bas-Oubangui. Essai de lutte antipianique, 1920.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. July–Aug.–Sept. Vol. 19. No. 3. pp. 319–334. With 1 map.

This study of yaws is based on the examination of 45,000 persons in the basins of the Middle Congo and the middle and lower Oubangui rivers ; over 2,000 cases were seen, many more than once. Generally speaking, the disease is the more common the further the villages are removed from these rivers or their tributaries. Children in the forest villages are often attacked in a proportion of 20 per cent. and for every adult who suffers there are nine children. In some localities the natives consider the eruption of yaws in the younger generation as natural as the eruption of teeth.

The author gives no detailed account of symptoms, but refers to some which are rarely mentioned. When the yaws lesions are generalized, in three-quarters of the cases lesions of the perineum or feet cripple the patients for months. About half the cases at the same time suffer a loss of flesh which may persist after natural recovery and may be regarded as a stigma of the disease ; sometimes it is so extreme as to merit the word cachexia. Such patients suggest the last stage of sleeping sickness and the author has at times examined the blood with this disease in mind. Anaemia is another symptom illustrated by the table.

Haemoglobin per cent.	Trypanosome-free children suffering from yaws before treatment.	Children free from both yaws and trypanosomes.
20	2	0
30	3	0
40	1	0
50	20	3
60	53	49
70	27	46
80	0	11

In the yaws patients in three-quarters of the cases the co-efficient of haemoglobin is 60 per cent. or less, whereas in more than half the others it is 70 per cent. and more. The anaemia observed in all is in part due to intestinal parasites and malaria.

Hypertrophic osteitis and goundou is the fourth symptom discussed and here he refers to his previous paper [see this *Bulletin*, Vol. 16, p. 468]. With fresh experience he is confirmed in his opinion that osteitis is part of the yaws syndrome. He has seen hypertrophic osteitis, with or without goundou, accompanying yaws in infants at the breast, in adolescents, and in adults, and notes that the natives associate the two conditions. Details of three cases are given. The author is so convinced that goundou is of the same nature as the hypertrophic osteitis which affects bones elsewhere that he speaks of goundou of the lower limbs and the elbows. As sequels of yaws he mentions ulcers, adherent cicatrices, and mutilations, the latter chiefly of the toes.

He discusses the association with yaws of malaria, helminth infections, and sleeping sickness; in the last instance the mortality is increased. The author thinks that wasted yaws children fare badly when attacked by enteritis or pneumonia. Indirectly the mortality occasioned by yaws is considerable.

Juxta-articular nodosities are next discussed. The author found in one area 29 cases among 500 persons examined and tabulates the body regions affected. All said they had had yaws and no signs of syphilis were detected, but the author cautiously refrains from drawing a conclusion.

Having a good supply of novarsenobenzol, he treated 1,200 cases. Using 1–1·5 cgm. per kilo body weight intravenously he cured 25 per cent. with a single injection, and 50 per cent. with two. He believes that an anti-yaws campaign in French Congo is possible and not difficult of execution, and suggests that it be combined with the campaign against sleeping sickness. Natives are drawn, he affirms, by arsenobenzol as bees by honey. He would give three injections to each patient and apply an antiseptic paste to the lesions.

A. G. B.

VAN DEN BRANDEN & VAN HOOF. **Contribution à l'étude de l'infection pianique chez les indigènes du Congo Belge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Vol. 2. No. 1. pp. 43–82.

This long paper deals with (1) the therapeutic activity of sulfarsenol in yaws, and (2) the Bordet-Wassermann reaction in that disease.

1. Sulfarsenol is described as the sodium salt of " l'ether sulfureux acide du monométhylolaminoarsénophénol." Notes are given of many cases to illustrate the rate of disappearance of treponemata from the lesions, the period at which the Bordet-Wassermann reaction becomes negative, the duration of the sterilization and of the absence of the Bordet-Wassermann reaction, and to compare sulfarsenol with other organic arsenicals. The general conclusions are that its therapeutic action equals that of neosalvarsan and novarsenobenzol. All, while they readily cure recent cases, affect chronic cases but slowly. The low toxicity of sulfarsenol and the ease with which it is given intramuscularly or subcutaneously renders it of special value in young subjects, fat females, and cachectics in whom intravenous injection presents difficulties.

2. The technique adopted was that of CALMETTE and MASSOL, which has the advantage of avoiding sources of error introduced by malaria. They studied 110 cases, and obtained the results shown below :—

B.-W.	Primary.	Secondary.	Tertiary.
Strongly Positive	7	38	27
Moderately Positive	0	3	3
Slightly Positive	1	1	1
Very Slightly Positive	2	2	5
Negative	1	5	1
Doubtful	0	1	0
No Haemolysis	0	6	2
Total	11	56	39

They conclude that the Bordet-Wassermann reaction in yaws is positive in about the same proportion of cases as in syphilis, that it is activated in recent cases and reactivated in latent cases under the influence of even minimal treatment, and that its negativation may be difficult to obtain.

The cases on which these figures are based were not grave ones ; there was no destruction of tissue or bone, such as one sees in gangosa. The disappearance of the lesions does not signify cure, and in one case where the dose was small and a relapse occurred the disease had become resistant to treatment. The B.-W. reaction indicates whether a cure has or has not been effected. Treatment must be continued till the sero-reaction is negative, and if it does not remain negative the test must be repeated at shorter or longer intervals.

A. G. B.

FOX (Howard) & OCHS (B. F.). **Frambesiform Syphilis (?).**—*Arch. Dermat. & Syph.* 1922. Mar. Vol. 5. No. 3. p. 411.

FOX (Howard). **The Prevalence of Yaws (Frambesia tropica) in the United States.**—*Ibid.* Dec. Vol. 6. No. 6. pp. 657–674. With 4 text figs.

The case is recorded of a full-blooded negress who left Montserrat in July for New York and developed an itching "pimple" on the thigh in November. At the same time she suffered from headache, pain in shoulder and chest, and sore throat, and a week later other lesions appeared. When seen she had 30 lesions in various parts of the body, dry and scaly or covered with dirty yellowish crusts. The removal of the crusts left a raspberry-like surface. Spirochaetes were found and the Wassermann was 4 +. Inoculations were made into the testes of four rabbits. A mild reaction was accompanied by slight lymphadenitis, and "over the surface of the tunics there were a number of minute granulomatous nodules identical in all respects with tunic nodules" observed in a strain of yaws isolated by Dr. NICHOLS. A histological report is given on a piece of tissue excised from the chest and two figures ; this also favoured the diagnosis yaws.

Dr. FOX discusses the occurrence of yaws in the United States from a reference by BRICKELL in 1737 onwards, but Dr. John LANE in the discussion refers to a letter written in 1687 from Virginia by Rev. John CLAYTON to Dr. Nehemiah GREW about a Distemper among the Indians called yaws "nearly related to the French-Pox."

The author notes that a report of the American Dermatological Association published in 1914, containing a tabulated list of 679,376 cases, included only 28 cases of yaws, all from the north and the majority from the large seaports, which strongly suggests importation. It is recognized as possible that cases in the south may be overlooked, but the author does not think that this is an adequate explanation. It is concluded that yaws is a rare disease in the United States in spite of its prevalence in the West Indies, that being a tropical disease it would not thrive in the northern states, and that even should it obtain a foothold in the southern states it could easily be eradicated.

In the discussion Dr. W. A. PUSEY could not understand why yaws is not found in the southern states, having regard to the close communication between gulf ports and the West Indies and the similar condition of the negroes in the Islands and the Gulf. He suggests that there is some factor other than "tropical climate" in its propagation. Dr. SCHAMBERG pointed out the similarity of the pictures in this case to those of his own [this *Bulletin*, Vol. 18, p. 252]. In the diagnosis between syphilis and yaws, apart from the swarms of spirochaetes found in yaws and the difficulty of staining them, there is the difficulty of maintaining the yaws infection in rabbits. The syphilis organism can be more easily perpetuated thus. He urges that in cases supposedly cured by arsenicals the Wassermann reaction be followed up.

A. G. B.

PARHAM (J. C.). **The Relation between Syphilis and Yaws as observed in American Samoa.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. July. Vol. 2. No. 4. pp. 341–349. (Discussion 349–352.)

The author, a naval surgeon who has spent 2½ years in American Samoa, regards yaws as "stone age syphilis." Though Samoa was visited by Dutch ships in 1722, and afterwards by French, British, and U.S. ships, missions were established in 1830, and since 1850 commercial intercourse with two of these nations and with Germany has been active, syphilis is not found. The author, as health officer in American Samoa, visited every incoming vessel carrying natives and examined all for gonorrhoea, a quarantinable disease ; he attended the native hospital for 2½ years ; he examined 3,226 natives in Tutuila for yaws and checked their numbers with the census ; but he never discovered any venereal disease. He concludes that the Samoan is not capable of infection by the *Treponema pallidum*. Similarly the Fijian is immune from syphilis, whereas both these peoples are affected in childhood to 100 per cent. with yaws. He refers to the published instances of yaws and syphilis in the same individual with incredulity, discounting CHARLOUIS' well-known experiment, and not referring to animal experiments, such as those of NEISSER and HALBERSTÄDTER (1907–8). He refers to the alleged differences in strains of syphilis, considers with HARPER that tabes and general paresis may result from yaws, and quotes BUTLER to the effect that yaws may be hereditary. In these ways he would bring it into line with syphilis, and he attributes its comparative mildness to the change in method of transmissal. "The lack of ancestral treatment combined with the difference in personal habits explains the clinical (framboesial) habitus of syphilis in these natives."

BUTLER, who discusses the paper, agrees with the author, and suggests that "under stone-age conditions of sanitation syphilis constitutes one of the exanthemata of childhood."

[Though the author does not definitely say so, he implies that gonorrhoea is a rare disease in Samoa. This would weaken the argument.]

A. G. B.

i. CHATELLIER (L.). **Sur un cas de pian avec altérations du liquide céphalo-rachidien et glycosurie.**—*Bull. Soc. française Dermat. & Syph.* 1921. Vol. 28. pp. 208–210.
ii. BORY (Louis). **Un cas de pian.**—*Ibid.* pp. 459–462. With 2 text figs.

i. A man who had lived 25 years in French Guiana had a generalized yaws eruption in February, 1920. This yielded to novarsenobenzol, but recurred in May, and in spite of a second course of arsenobenzol, again in November. He was admitted to hospital in January, 1921, when he had a typical crusted yaws eruption on face, hand, arm and back. From a large papule serum was expressed which contained spirochaetes in abundance. The urine contained glucose, 12 gm. per litre, no albumen. The W.R. was strongly positive. The cerebrospinal fluid contained 10 lymphocytes per cmm., and gave a very strongly positive W.R. After five injections of novarsenobenzol the lesions vanished and the sugar in the urine fell to 4 gm. per litre. No other treatment had been given. From these findings the author concludes that the yaws spirochaete can cause lesions of the viscera.

ii. The patient, a Soudanese soldier in France, had three varieties of lesions: framboesiform chiefly on the face, syphilitiform plaques in the ano-genital region, scattered pityriasis-like spots. The lymphatic glands were generally enlarged and hard. The W.R. was strongly positive. Fine treponemata were seen, indistinguishable from Schaudinn's parasite. The lesions rapidly yielded to large mercurial injections. The author comments on the close relation between yaws and syphilis.

A. G. B.

COPPIN (H.). **Zona intercostal chez un planique [pianique] traité par le sulfarsenol.**—*Bull. Soc. Med.-Chirurg. Indochine.* 1921. Dec. Vol. 12. No. 2. pp. 150–152.

A child, aged six, entered hospital for yaws of three months' duration. The lesions are described at length. After three injections of sulpharsenol and a month after admission an eruption of herpes zoster appeared at the ninth rib. There was no pain, but this is believed to be the rule in the child. The author suggests that the attack of shingles was a complication of yaws, but admits the possibility that it was due to the arsenical.

A. G. B.

i. TOURNIER (E.). **Le traitement du pian par les injections sous-cutanées de Novarsénobenzol.**—*Ann. de Méd. et Pharm. Colon.* Paris. 1922. Jan.–Feb.–Mar.–Apr. Vol. 20. No. 1. pp. 37–39.
ii. ——. **Le traitement du pian par les injections sous-cutanées de Novarsénobenzol.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 489–491.

i. Yaws is very common in Togo, and is one of the chief factors of infantile morbidity. In native children intravenous injection presents difficulties, so that the author turned to hypodermic medication. In rapidity of action and efficacy the two methods were comparable, the characteristic yaws eruption disappearing after a second injection in the majority of cases. The tertiary lesion, hypertrophic osteitis, if it is really to be attributed to yaws, was more resistant. Novarsenobenzol is to be preferred to other arsenicals; galyl can be given only intravenously, metarsenobenzol occasioned abscesses, sulfarsenol was painful and often caused induration. The arsenobenzol, in concentrated solution in serum, is injected behind the shoulder into the cellular tissue near the external margin of the scapula. In 19 instances out of 287 a swelling formed which disappeared in a week; abscess was never seen. Doses of 15, 30, 45 and 60 cgm. are dissolved in 2–4 cc. of serum. He usually begins with 30 cgm., giving 45 at the second injection six days later; 18 per cent. of cures were obtained after the first injection, and 60 per cent. after the second; 22 per cent. required further treatment, which took the form of Gibert's syrup (biniodide of mercury). The advantages claimed for this method are its simplicity and harmlessness; it can be used with safety by a hospital assistant. It has the further merit that the patient need not be fasting, a state which it is not easy to secure in young children.

ii. This is a briefer account of the same series of injections, but the arsenical is here stated to have been dissolved in sterilized salt solution, 4 in 1,000. In the discussion VINCENT advised the treatment of children with yaws by enemata of "914."

A. G. B.

BEURNIER & CLAPIER. **Traitement du pian par le 189 administré par la voie buccale.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 528–533.

The authors give short notes of 16 cases of yaws treated by the mouth with "189" with success, 5 cases in which the efficacy was less, and in 4 of which resort was had later to injections, and 2 in which diarrhoea set in, the drug was withheld, but death followed. They first used it at 48-hour intervals, later, owing to toxic symptoms, at 72 hours. Such symptoms are grave disturbances of vision and diarrhoea with albuminuria. Diarrhoea may not be detected promptly in negroes owing to the satisfaction bred in them by easy evacuations. The authors consider the drug a valuable one in yaws if the following directions be followed:—For injections do not exceed the dose of 1·5 cgm. per kilo, and in any event do not pass 1 gm. Repeat the injections at 48-hour intervals till the third or fourth time, then every three days till the sixth or seventh. The drug is more active in subcutaneous injection than by the mouth and is better tolerated; injections, therefore, are to be preferred for hospital use, but the oral method could be practised in the bush by the natives themselves on the first manifestation of yaws.

A. G. B.

BEURNIER & CLAPIER. **Premiers essais du 189 au Gabon. (Pian, Syphilis, Ulcères phagédéniques.)**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 607–613.

Yaws.—Every other day an intramuscular injection of a freshly sterilized and cooled 10 per cent. solution of "189" was given, 1 gm. to adults, 0·3–0·75 to children. A more concentrated solution caused abscess. Notes are furnished of 15 cases, all of which recovered.

Other patients ceased to attend, and were probably cured, or at least improved. The conclusion is reached that an average of 4 to 6 injections of " 189 " at 48-hour intervals cures acute generalized yaws. This treatment and that by novarsenobenzol are compared, and the authors seem to prefer " 189."

Tertiary Syphilis.—Two patients with extensive ulceration, which may have been syphilitic, were treated with success. The authors comment on the abuse of this diagnosis in the tropics.

Phagedenic Sores.—The ulcer is curetted and thermo-cauterized. Gauze soaked in a 10 per cent. solution of " 189 " is packed in and secured by wool and a bandage. An injection of 1 gm. is given, and every other day the wound is dressed and the same solution applied. Of 23 cases 20 began to improve after the second dressing and injection and the phagedenic process ceased, but in 15 instances other treatment was necessary to effect cure. A case is mentioned in which the use of 16 gm. in 21 days was followed by profuse diarrhoea and loss of vision.

A. G. B.

AUDEN (F. T.). **Antimony in Yaws.** [Correspondence.]—*Brit. Med. Jl.* 1922. July 15. p. 83.

As a result of the perusal of Dr. CAWSTON's description of the treatment of syphilis by antimony at Durban, the author, among whose duties it is to treat some 7–8000 natives for yaws in British East Africa, gave a few acute cases intravenously 1 gr. of tartar emetic daily for 8–10 days. No improvement was noted, and the patients, accustomed to see their fellows cured in three days by galyl or arsenobillon, became restive and demanded their discharge.

A. G. B.

VAN DEN BRANDEN. **Sels de bismuth dans le trypanosome humaine et le pian. Cacodyline dans la trypanose humaine.**—*Bruxelles Méd.* 1922. Aug. 20. 2nd Year. No. 20. pp. 507–508.

" Bi 36," a bismuth preparation of Belgian manufacture, was given intramuscularly dissolved in water in three cases of yaws. The lesions rapidly dried up and disappeared. The injections were well tolerated. The effect on the serological reaction remains to be tested.

A. G. B.

VISWALINGAM (A.). **Yaws in Malaya. Its Treatment and Prophylaxis.**—*Indian Med. Gaz.* 1922. May. Vol. 57. No. 5. pp. 172–175.

A general account of yaws, from which 25 per cent. of the Malays in Kuala Kangsar and Upper Perak are said to suffer.

A. G. B.

TUBERCULOSIS IN THE TROPICS.

CALMETTE (A.). **Les modes de diffusion de la tuberculose à travers le monde.**—*Rev. d'Hyg. et de Police Sanitaire.* 1921. Aug. Vol. 43. No. 8. pp. 654–662.

This important paper, delivered as an address to the Congress of the International Union against Tuberculosis in London on July 27, 1921, begins by a discussion on the frequency of tuberculosis amongst civilized peoples and its rarity amongst savage and nomadic races. For the determination of the degree of diffusion of infection in any given community, stress is laid upon the value of the Von Pirquet test, which the author, with characteristic sincerity, declares to be the best for the purpose, making no mention of his own excellent ophthalmic reaction which, though, in our opinion, less generally applicable than the cutaneous test, has, nevertheless, been of great utility in mapping out the distribution of the disease. The researches of METCHNIKOFF, ZIEMANN, Otto PEIPER, and others, are quoted to show how small is the percentage of positive results of tuberculin tests amongst communities living in relative isolation, and, in contrast to this fact, the high proportion of positive results in the large cities of Western Europe and America is noted as a proof that almost every individual in these cities must, sooner or later, become infected to some extent with the tubercle bacillus. Turning to the mode of diffusion of infection, Calmette while admitting that the heavily infected phthisic is the most dangerous source of infection, calls attention to the clear evidence, afforded by the observations of SCHROEDER and COTTON in America, and his own work in collaboration with GUÈRIN in France, that large numbers of individuals, apparently healthy, are able to act as "intermittent carriers" owing to the existence of lesions either occult or only to be inferred from the fact of a positive tuberculin test. He quotes some of his own experiments proving that tubercle bacilli are frequently eliminated in the bile after intravenous inoculation in experimental animals, and he is of opinion that the intestinal route is a more important factor in the diffusion of infection than is generally believed. Laying stress on the fact that even small doses of infective material may, especially if frequently repeated, suffice to produce disease in susceptible persons such as children, negroes and others who are virgin soil to the germ, he points to the potential danger of apparently healthy "intermittent carriers" when they happen to be engaged in work, such as that of the explorer, the sailor or the merchant, which brings them into contact with the inhabitants of isolated parts of the earth's surface. The paper is a most suggestive and valuable one, though we are inclined to think that the danger of the intermittent carrier is not very great except to the infants and young children brought in close contact with him under *home* conditions.

S. L. Cummins.

LEGENDRE (Jean). **La Tuberculose dans nos Colonies.**—*Bull. Soc. Path. Exot.* 1922. Jan. Vol. 15. No. 1. pp. 51–52.

Legendre writes briefly to call attention to the danger to which the natives of certain of the French colonies are exposed by the return of ex-soldiers of native races infected with tuberculosis during service in France or in the occupied territories. He points out that the 1,662 infected persons repatriated to West Africa, Madagascar, Indo-China and the Pacific since the end of hostilities up to June, 1921, are capable of becoming foci of an infection almost certain to spread widely in countries where hygiene does not exist and where the inhabitants are notoriously susceptible to tuberculosis. As the author puts it: " Nous aurons ainsi introduit et acclimaté dans nos deux grandes possessions, déjà si éprouvées par des affections épidémiques et endémiques, une maladie meurtrière de plus." It would seem that it is not only in the British Empire that the responsibility of a dominant nation for the natives of its dependencies is forgotten or ignored.

S. L. C.

McDONALD (W. M.). **Pulmonary Tuberculosis as a Problem of Tropical Medicine.**—*Jl. Trop. Med. & Hyg.* 1922. Mar. 15. Vol. 25. No. 6. pp. 69–71.

In this paper, the author makes the excellent point that the subject of tuberculosis is too much ignored in the instruction of physicians for practise in the tropics. This is only too true and the paradox is frequently met with of the young doctor, well trained to deal with sleeping sickness, kala azar, beriberi and many other interesting diseases, at last face to face with the *real* problem of some tropical settlement which proves to be none other than tuberculosis after all, the study of which he has somewhat neglected. The most valuable passages in the paper are those dealing with the differential diagnosis of tuberculosis and malaria. " We must bear in mind that it is just when we feel sure that the case is obviously malaria that we are most likely to omit investigation for possible pulmonary tuberculosis." Less sound are the paragraphs in which fresh air and exercise are dealt with. "The onset of pulmonary tuberculosis is like the lighting of a fire. The fire once lit, exertion is the fan which spreads the flame ; rest is the water which quenches it." This is just the sort of half truth that is apt to mislead. The phrase is probably quite accurate so far as concerns the tuberculosis of patients of African stock but it is inapplicable to many of those met with under conditions of Western civilization, in whom controlled auto-inoculation through graduated exercise is by far the most hopeful treatment.

S. L. C.

POWELL (Arthur). **Some Observations on Tuberculosis in India.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Sept. Vol. 15. No. 11. pp. 56–62.

Such a paper as that now under consideration, dealing authoritatively with tuberculosis as seen in India, has been long awaited by students of the disease. We know the conditions in Africa, thanks to the many excellent observations of French scientists inspired by the suggestions of CALMETTE, and to the sound work of ZIEMANN and others in German Colonies. The observations of METCHNIKOFF, BURNET and TARRASSEVITCH, have informed us on the phenomena of the disease in the steppes of the Kalmuck Tartars. Scott has familiarized us with the conditions obtaining in Hong Kong; and Bushnell has recorded the manifestations of tuberculosis amongst American Indians and negroes. There are many fairly good articles about tuberculosis in India and a recent book by Lankester adds considerably to our knowledge; but Dr. Powell's paper is far the most important contribution to the subject that we have yet met with. His knowledge is derived from many years of service and observation as Medical Officer to the Bombay City Police, a force ranging in strength from 2,300 to 3,000 men and recruited to a great extent from country districts. Amongst these men, tuberculosis is exceedingly common and of a progressive and fatal type. Of 1,532 recruits tested by the Von Pirquet reaction between 1912 and 1918, only 87 or 5·67 per cent. were found to be "positive." Amongst 12,000 young men, mostly recruits, newly arrived from the country, and carefully examined, special attention being paid to the lungs, the number found to be suffering from pulmonary disease was extremely small. Whereas in Europe about 85 per cent. of bodies are found at autopsy to show signs of old tuberculous infection, the proportion of cadavers found by Powell to contain such lesions was, in over 8,000 post-mortems on Indians, only 2·3 per cent. "Fibroid phthisis was rarely seen." It is clear, therefore, that these people have had none of the minor infections that lead, in Europe, to the acquisition of resistance. Under these circumstances it is usual to find that the clinical manifestations of the disease are acute and severe. In India, too, this rule is found to hold good. "Tuberculosis in the Indian is much more acute, and more rapid, than in the European: recovery is the exception. I think we can safely say that the great majority of Indian patients die within a year of their first symptoms." The headings of the paragraphs of Dr. Powell's paper serve, in themselves, to give a vivid idea of the facts:—

> "The first symptom of tuberculosis in a majority of Indians is fever—not cough. . . .
>
> "The first physical sign in Indians is often a deposit at the hilum of the lung when fever is the only symptom present. . . .
>
> "'Low Fever' is often incipient tuberculosis. . . .
>
> "Haemoptysis is relatively uncommon among Indians. . . .
>
> "In adult Indians acute tubercular broncho-pneumonitis is very frequent, though in Europe it mostly occurs in children. . . .
>
> "Many apparently typical cases of lobar pneumonia in Indians are tubercular. . . .
>
> "Bovine tuberculosis is practically non-existent in Bombay."

This last observation is worth noting. It is so frequently the case that an absence or rarity of bovine tuberculosis coexists with a very acute type of disease in man that it is difficult to avoid the conclusion that the two phenomena are related. The author is mindful of this possibility. He says, "the absence of bovine tubercle may be a factor in the acuteness of human tuberculosis in India."

The picture that he draws of sanitation in Bombay will be recognized as correct by all those who have helped to shoulder this part of "the White Man's Burden" in the East.

It is to be hoped that some of our tuberculosis experts so familiar with the disease as seen in England and so blind to its manifestations elsewhere, may peruse what is one of the most instructive papers that have appeared about tuberculosis in recent years.

S. L. C.

CURASSON. **Relations entre la tuberculose humaine et la tuberculose porcine à Dakar.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Nov. Vol. 1. No. 4. pp. 7–12.

This short paper by Veterinary Surgeon Curasson is of real value since it approaches the question of tropical tuberculosis from a point of view that has received too little attention.

After referring to the extreme rarity of bovine tuberculosis in West Africa, he make a notable exception of a race of cattle known as Lagunes in Dahomey, amongst which there appears to be a tuberculosis morbidity of about 33 per cent. This exceptional race of cattle would appear to merit the closest study as to the exact nature of their infection, the type of tubercle bacillus concerned, and how the infection first arose ; and it is to be hoped that further information will be forthcoming in the future.

M. Curasson now passes on to describe five instances observed by him at Dakar of tuberculous infection of the retropharyngeal lymphatic glands in pigs. Careful post-mortem examination and the inoculation of the caseous material into guinea-pigs rendered it possible to make a definite diagnosis of tuberculosis. The mode of infection was probably through the ingestion of contaminated material over an area covered with ordure close to the municipal dump, where pigs are turned out to feed by their native owners. The fact that the disease had started in the retropharyngeal glands supports this theory since it points to infection by the alimentary tract.

The danger of porcine infection is considerable for man, since sausage makers use uncooked material. In the discussion M. HECKENROTH pointed out that the danger would chiefly affect Europeans as the native population does not eat sausages. He made some instructive remarks as to the distribution of human tuberculosis in French West Africa and attributed the marked susceptibility of the native of the inland districts to the " absence of all chance of the relatively immunizing previous contact " with the germ. The inhabitants of Dakar, an urban area, however, tend to exhibit the ulcero-caseous form of pulmonary tuberculosis which, in them, takes the relatively benign form commonly met with in Europe.

S. L. C.

NOC & HUCHARD. **La tuberculose à Dakar.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. June. Vol. 2. No. 6. pp. 168–170.

The authors call attention to the paper by BORREL in the *Annales de l'Institut Pasteur* on March, 1920 [this *Bulletin*, Vol. 16, p. 190], and note the distinction drawn by him between the rarity of tuberculosis in the districts and villages of the interior of Senegal and its relative frequency in the towns where there is closer contact between the natives and Europeans. They cite three cases that have recently come to their knowledge at Dakar in all of which the clinical picture was that of tuberculosis ; but it is to be noted that in not one of the three was the diagnosis made absolute by the demonstration of tubercle bacilli in the sputum. Of more critical importance is the fact, recorded by the authors, that out of 120 sputa examined at the Bacteriological Laboratory of French West Africa 25 samples were found to contain Koch's bacillus. M. BEAUJEAN, in the discussion which followed, cited a case seen by him at Dakar with " positive " sputum. He criticized the rather loose application, by BORREL and others, of the name " Senegal " to all the French West African Colonies taken as a whole.

S. L. C.

CURASSON (M.). **La tuberculose animale en A. O. F. ; ses rapports avec la tuberculose humaine.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. July. Vol. 2. No. 7. pp. 188–190.

Following his note on tuberculous lesions of human bacillary type found in Dakar, Curasson gives further particulars of the curious endemicity of tuberculosis amongst the lagune race of cattle of Bas-Dahomey [see this *Bulletin,* page 186] to which the author had referred in his previous paper. It would seem that the striking frequency of tuberculous lesions, often generalized, amongst these cattle led PIERRE and PECAUD to verify the nature of the disease by bacteriological investigation, these workers proving the condition to be definitely tuberculous. It is clear that the question of race does not enter into consideration, as other strains of cattle of African origin brought into contact with the lagune beasts are easily infected. The conditions of stalling of these latter are extremely bad and calculated to facilitate the spread of infection once introduced. Fortunately there is a zone of territory in which domestic animals do not live which separates these infected cattle from other cattle regions and the endemic is thus very strictly confined in extent. This limited zone presents a marked contrast to the rest of West Africa, where tuberculous infection has been up to the present almost unknown. Quite recently, however, COPPEY at Bamako and the author at Dakar, have met with tuberculosis of the udder in native cattle, the bacilli being of human type. In one of the cases noted by Curasson, the cow was from a farm where a brother of the proprietor had recently died from tuberculosis. No mention of the bacillary type prevalent amongst the lagunes is made, but information on this point would be of the greatest interest. The reviewer in 1902 failed to discover a single case of tuberculosis amongst many cattle coming under his notice in the Bahr-el-Ghazal in the Anglo-Egyptian Sudan, and it seems that this has been the almost universal experience of those who have given attention to the point in the non-Europeanized districts of Africa. These notes of M. Curasson are of the highest interest and importance.

TEPPAZ (L.). **La tuberculose bovine à l'abattoir de Dakar.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 356–357.

Teppaz brings to notice a case of tuberculosis in a zebu at the slaughter house of Dakar, the first instance of bovine infection seen by him in the thousands of cattle that he has examined both at Dakar and Saint Louis. The infection was slight and such as might have disappeared spontaneously, and the animal was in excellent condition. The pus from an incised " tubercle " was found microscopically to contain tubercle bacilli in very small numbers. On inoculation into a guinea-pig, the animal became infected and the bacilli were found in large numbers at the site of inoculation. It is clear, therefore, that the zebu is not refractory to infection with tuberculosis. Inoculation of a rabbit has been carried out to verify the nature of the strain, but it seems probable that it was of human origin, since the disease is practically non-existent in cattle but increasingly common amongst men in Senegal.

S. L. C.

LEGER (Marcel) & HUCHARD (G.). **Contribution à l'étude de la Tuberculose au Sénégal : cuti-réaction chez les enfants de Dakar.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 344–348.

L'extension de la tuberculose au Sénégal s'impose à l'attention des practiciens." It is the same story everywhere throughout those colonial possessions from which levies of natives were brought to Europe during the Great War or where the spread of western culture has thrown the natives and their European masters into close juxtaposition. Leger and Huchard, in the paper under review, record their investigations as to the proportion of native school children reacting to the Von Pirquet tuberculin test, and they find it to be high: no less than 38 per cent. for children from 7 to 10 years old and 49 for those between 10 and 15. It is recalled that, in 1911 and 1912, COMMELERAN found but 9 per cent. in subjects between 1 and 15 in Tivaoune and neighbouring Senegalese villages, FONQUERNIE 12 per cent. at Bakel, and CAZENEUVE and BAISEZ 11 per cent. in Casamance, while at Saint Louis the proportion was 27·5 per cent. " Dans les deux grandes villes du Sénégal, les autochtones ont reçu, en même temps que la civilisation apportée par les Français de la métropole, les tares maladives de ces derniers." The authors promise a further communication on the tracing of the tuberculin-positive children back to their homes. This will be awaited with interest.

S. L. C.

LEGER (Marcel) & PEZET (O.). **Quelques documents sur la cutiréaction à la tuberculine en Guinée française.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 354–356.

The authors have investigated the distribution of latent tuberculous infection by means of the cuti-reaction in the Schools of Kindia and of Conakry in French Guinea, and find at the former place, 17·7 per cent. positive from 5 to 10 years, 28·3 per cent. positive from 10 to 15 years ; while at the latter, the proportions are 20 per cent. and 37·5 per cent.

In 1911, WAGON found at Kindia only 12 per cent. of all ages to give a positive reaction, all except one of those reacting having been in contact with Europeans or Syrians. In the same year, BONNEAU found, amongst school children from 5 to 15 years old, at Conakry, only 3·5 per cent. of positives. It is therefore clear that the distribution of latent tuberculosis is much wider than it was 11 years ago. The authors are of opinion that a thorough anti-tuberculosis campaign is necessary both in French Guinea and in Senegal.

S. L. C.

HUDELLET. **Prophylaxie antituberculeuse en A.O.F.**—*Bull. Soc. Med.-Chirurg. française de l'Ouest-Africain.* 1921. June. Vol. 3. No. 16. pp. 103–107.

Hudellet cites two cases of Pott's disease in adults, one in a native of Portuguese Guinea resident in Dakar, the other in a native woman who had never quitted Dakar. He notes the decided increase of tuberculosis in Dakar since the war and the large number of returned soldiers of African race who have developed bony tuberculosis. He advocated the starting of a Tuberculosis Dispensary on the lines of the Calmette Dispensary in Paris.

The discussion, in which Drs. LE DANTEC, RIGOLLET and JOUENNE quote their experiences, brings to light several points of interest; that the conditions for the spread of tuberculosis are much more dangerous in the town-community of Dakar than in the villages of the interior; that the organization of dispensaries, while possible in Dakar itself, would be quite out of the question in the bush districts; and that the type of tuberculosis amongst returning Senegalese troops is so severe as to kill its victims very quickly and thus solve in some measure its own problems of infection.

S. L. C.

i. PARROT (L.) & FOLEY (H.). **L'étude de l'infection tuberculeuse en milieu indigène par la cuti-réaction à la tuberculine.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 72–78. With 1 coloured plate.

ii. —— &——. **L'infection tuberculeuse chez les indigènes musulmans d'Algérie.**—*Ibid.* pp. 79–110. With 1 map.

i. The first of these two papers deals with the technique and the statistical methods employed in the investigations set forth in the second. The technique is a simple one, the cuti-reaction of VON PIRQUET being employed for the mapping out of the distribution of tuberculous infection throughout the French colonies in North Africa, and the method being standardized as far as possible in order to make the work of various observers comparable. The cuti-reaction is carried out by means of linear scarifications on the outer surface of the upper arm, upon the skin of the deltoid region. The tuberculin used is that supplied by the Pasteur Institute of Algiers; a "dry" control scarification is made close by, and operators are advised to make their incisions very superficial; "moins ça saigne, mieux ça vaut." So far as concerns the statistical records, these are of the simplest kind, consisting merely of comparative percentages of positive reactions according to race, locality, sex and "age group." It is laid down that a percentage has no value unless it is based on upwards of 50 observations, and that its value increases with the number of observations on which it is based.

In the opinion of the authors, the degree of tuberculous infection of a given region would seem to be known when, on the one hand, the percentage of reacting children from 1 to 15 years is ascertained, and on the other, that of adults, persons of 16 years and upwards. By the aid of these data, it is a simple matter to calculate the mean percentage for the area concerned, the "Index Tuberculinique Totale." It is found that, in infants of less than 1 year, the tuberculin reaction is almost universally negative, and it is therefore preferable to leave it out in estimating the percentage of positive reactions in children.

The following simple scheme is used for all records :—

COMMUNE OF

Region { Littoral. Table land. Saharian. } Population { Arab. Berber. Jewish. }

Positive Cuti-reactions.

Age.	Details.		Total ♂ and ♀	Total from 1 to 5 years.	Total from 6 to 15 years.	Total from 1 to 15 years.	Total Adults.
	♂	♀					
From 1 day to 1 year	0 in 15	0 in 24	0 in 36				
From 1 to 2 years	1 in 32	2 in 40	3 in 72	21 in 158 13·2 per cent.		78 in 302 25·8 per cent.	
From 3 to 5 years	10 in 40	8 in 46	18 in 86				
From 6 to 10 years	11 in 49	12 in 39	23 in 88		47 (*sic*) in 144 32·6 per cent.		
From 11 to 15 years	14 in 18	20 in 38	24 (*sic*) in 56				
From 16 to 30 years	12 in 17	14 in 20	26 in 37				80 in 109 73·4 per cent.
From 31 to 45 years	20 in 29	15 in 19	35 in 48				
From 46 and over	10 in 12	9 in 12	19 in 24				

From the totals .. { Children : 78 positive cuti-reactions in 302 subjects, giving 25·8 per cent.
Adults : 80 positive cuti-reactions in 109 subjects, giving 73·4 per cent.

∴ the "index tuberculinique totale" is $\frac{25\cdot8 + 73\cdot4}{2}$ = 49·6 per cent.

ii. On the advice of A. CALMETTE, and following the lead given by METCHNIKOFF, BURNET and TARASSEVITCH (1911), in their investigations amongst the Kalmuk Tartars, a comprehensive survey of the distribution of tuberculous infection in North Africa was inaugurated by the Pasteur Institute of Algiers in 1911. The paper under review deals with more than 8,000 cuti-reactions carried out from the inception of the research to date. The Pasteur Institute of Algiers is to be congratulated on this opportune investigation, which, if it had been delayed, would have lost much of its value, owing to the rapid spread of European penetration into the regions concerned and the consequent increasing exposure of the natives to exogenous infection. The observations are grouped under the main headings of locality as follows :—(1) Littoral Tellien ; (2) Hauts-Plateaux ; and (3) Sahara. In each of these main groups, particulars of each racial type by age groups are given, together with a running commentary upon the local conditions, facilities for exogenous contact, tribal customs, housing, occupation and relative prosperity. To appreciate the paper as a whole, it must be read in the original, but much information is given in the Recapitulation Table here reproduced. The main conclusions are as follows :—

1. Latent tuberculous infection is less widespread amongst the Mohammedan peoples of Algeria than amongst the people of Europe, but more so than amongst certain primitive groups in West and Equatorial Africa.

2. The infection attains its maximum of frequency along the coast, its minimum in the Sahara.

3. In the three main regions investigated, the degree of infection of the Mohammedan populations is a function of the following factors :—

(*a*) *Proximity of Europeans*: the degree of infection increasing with the proximity, the length of time and the numerical importance of the European penetration, as well as with all those geographic, economic and social factors that favour, increase or prolong the contact with Europeans.

(*b*) *Ethnic origin*: the " white " natives of both Arab and Berber stock showing more infection than the darker natives ; those using the Arabic language being, again, more infected than those using the Berber tongue.

(*c*) *Habitat*: nomadic tribes of tent dwellers and certain sedentary groups living in scattered huts showing, in all racial and other sections, less infection than the people living a sedentary life in village agglomerations.

4. Tuberculous infection attains its maximum in agglomerated and sedentary communities living in permanent contact with Europeans or brought into contact with them through temporary migration.

5. The investigation confirms and verifies the modern view as to the inter-dependence of socio-geographic isolation and a low degree of tuberculous infection in peoples of backward civilization.

These conclusions, of fundamental importance in the study of the epidemiology of tuberculosis, not only in Africa but as a problem affecting mankind in general, deserve to be widely read, especially by those who have had no opportunity of studying tuberculosis except in a European community and yet are charged with the framing of regulations and schemes for its control. The splendid example given by the Pasteur Institute of Algiers might well commend itself to those responsible for the Medical Services of our colonies, dominions and protectorates.

Cuti-reactions to Tuberculin in Mohammedan Natives of Algeria.*
Recapitulation Table of the Statistical Results.

	Locality.	Date of Enquiry.	From 1 day to 1 year.	From 1 year to 5 years.		From 6 to 15 years.		Total of 1 year to 15 years.		From 16 years and over (Adults).		Total, Children and Adults.†	Index total $\frac{A+B}{2}$
					Percentage.		Percentage.		Percentage. (A.)		Percentage. (B.)		
Littoral Tellien.	Alger	1911–16	1 in 51	10 in 50	20·0	34 in 65	52·3	44 in 115	38·2	5 in 7	71·4	49 in 122	54·8
	Ain-Bessen ..	1915	0 in 3	1 in 4	—	11 in 17	—	12 in 21	57·1	173 in 249	69·4	185 in 270	63·2
	Arba, bourg ..	1912	1 in 6	5 in 17	—	11 in 21	—	16 in 38	42·1	32 in 45	71·1	48 in 83	56·6
	,, banlieue..	1912	0 in 11	4 in 44	—	22 in 54	40·7	26 in 98	26·5	49 in 56	87·5	75 in 154	57·3
	,, (à 10 kilo)	1912	0 in 21	9 in 68	13·2	27 in 107	25·2	36 in 175	20·5	62 in 104	59·6	98 in 279	40·0
	Duzerville ..	1911–12	0 in 32	20 in 112	17·8	40 in 116	34·4	60 in 228	26·3	7 in 9	77·7	67 in 237	52·0
		Total I.	2 in 124	49 in 295	16·6	145 in 380	38·1	194 in 675	28·7	328 in 470	69·7	522 in 1,145	49·2
Hauts-Plateaux.	Gambetta ..	1914	0 in 44	61 in 275	22·1	106 in 213	49·7	167 in 488	34·2	—	—	167 in 488	—
	Barika ..	1916	0 in 61	69 in 446	15·4	233 in 556	41·9	302 in 1,002	30·1	—	—	302 in 1,002	—
	El Kantara ..	1918	2 in 25	4 in 35	—	54 in 126	42·8	58 in 161	36·0	6 in 7	85·7	64 in 168	64·2
	Méchéria ..	1922	0 in 4	4 in 37	—	49 in 127	38·5	52 in 164	31·7	125 in 196	62·7	177 in 360	47·2
		Total II.	2 in 134	137 in 793	17·2	442 in 1,022	43·2	579 in 1,815	31·8	131 in 203	64·0	710 in 2,018	47·9
Sahara.	Biskra	1922	0 in 101	80 in 194	41·2	154 in 262	58·7	234 in 256	51·3	182 in 246	73·9	416 in 702	62·6
	El Oued ..	1920	0 in 93	51 in 237	21·5	239 in 424	56·3	290 in 661	43·8	164 in 217	75·5	454 in 878	59·7
	Ouargla ..	1919	0 in 14	16 in 76	21·1	84 in 267	31·4	100 in 343	29·1	99 in 188	52·6	199 in 531	40·8
	El Goléa ..	1920	2 in 26	9 in 50	18·0	54 in 250	21·6	63 in 300	21·0	30 in 120	25·0	93 in 420	23·0
	Tremassinine ..	1918	—	1 in 13	—	1 in 18	—	2 in 31	6·4	11 in 45	24·4	113 in 76	15·4
	Tidikelt ..	1918	0 in 18	8 in 74	10·8	80 in 245	32·5	88 in 319	27·5	106 in 198	53·5	194 in 517	40·5
	Hoggar ..	1919	0 in 3	3 in 36	—	22 in 56	39·2	25 in 92	27·0	133 in 236	56·3	157 in 328	41·6
	Fignig	1911–14	0 in 11	3 in 93	3·2	38 in 205	18·5	41 in 298	13·7	69 in 176	39·2	110 in 474	26·4
	Touat-Gourara..	1913	0 in 19	11 in 99	11·1	49 in 136	26·3	60 in 235	25·5	194 in 337	57·5	254 in 572	41·5
		Total III.	2 in 285	182 in 872	20·8	121 in 1,863	38·7	903 in 2,735	32·9	988 in 1,763	56·0	1,891 in 4,498	42·0
	Totals I, II and III.	..	6 in 543	368 in 1,960	18·7	1,308 in 3,265	40·0	1,676 in 5,225	32·0	1,447 in 2,436	59·4	3,123 in 7,661	45·7

---

* In this table the first figure (on left) gives the number of positive cuti-reactions; the second figure (on right) the number of cuti-reaction tests performed.

† Infants from 1 day to 1 year are not included in this total.

ALQUIER (A.). **Etude de l'infection tuberculeuse par la cuti-réaction à El Goléa (Oasis sahariennes).**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 111–113.

This brief paper should be read in connexion with that by PARROT and FOLEY in the same journal; its contents making an interesting commentary on their conclusions. The oasis of El Golea is one of the most completely isolated parts of North Africa, being 360 kilometres from the nearest centre. It is celebrated for the relative mildness of its climate, the abundance and purity of its water, and the beauty of its gardens. Its inhabitants number about 5,000 and consist of an Arab aristocracy, owning the land, but of nomadic habits and only residing at El Golea during the date harvest. The land is cultivated for them by negroes, the descendants of slaves brought from the Sudan by the Arab caravans in former days. The point brought out by the author is that, with a very low "index tuberculinique total," amounting to only 23 per cent., the disease is assuming a very severe and rapid type. It is a striking instance of the extreme susceptibility of persons hitherto uninfected and unprotected by contact with carriers of the germ. The author has a vivid style, and gives us an excellent pen picture of the lazy, improvident life of a North African oasis where, in spite of fair natural advantages, people starve because they are too lazy to work, and where hygiene is unknown.

S. L. C.

JAME (L.). **Etude de l'infection tuberculeuse en milieu nomade. (Annexe de Mecheria.—Hauts-Plateaux oranais.)**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 371–373.

This short paper deals with tuberculosis in the Annexe of Mecheria in the Hauts-Plateaux of Algeria, a region inhabited by nomadic tribes. The results of tuberculin tests are divided into those of the nomad tribes close to large fixed communities on the one hand and those of the remoter nomads on the other. Amongst the former, the "total tuberculin index" is 50·59 per cent.; amongst the latter, 45·35 per cent. The difference is chiefly to be noticed in the lower age groups; this being 37·56 per cent. amongst the children of those tribes in proximity to towns, but only 26·35 per cent. amongst the more distant tribes. The author attributes the increasing amount of tuberculosis amongst these communities to contact with Europeans in the towns and the return of infected soldiers from military service.

S. L. C.

SABRIÉ (R.). **La tuberculose dans quelques oasis des Ziban Zab Dahraoui (El Amri; Foughala; Farfar; El Bordj; Tolga).**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 358–370. With 1 map.

This communication deals with tuberculosis amongst the inhabitants of Zab Dahraoui, including the oases of El Amri, Foughala, Farfar, El Bordj and Tolga. Of these, the most populous and important is Tolga, a community of 2,500 persons, the terminus of the Biskra-Touggourt Railway, and the principal market centre of the area. Tables are given showing, for each oasis, the details of distribution of positive tuberculin reactions (Von Pirquet) by age and sex. It will suffice to quote those given for the whole area, dealing with 1,113 observations, which are as follows:—

From 1 to 5 years	37·06 per cent.
6 to 15 ,, ...	59·83 ,,
1 to 15 ,, ...	49·84 ,,
Adults	74·56 ,,

The high percentage between 1 and 5 years of age is remarkable.

S. L. C.

ARCHIBALD (R. G.). **Tuberculosis in the Sudan, with Notes on a Case of Breast Tuberculosis in a Sudanese.**—*Ann. Trop. Med. & Parasit.* 1922. Oct. 18. Vol. 16. No. 3. pp. 235–242. With 1 plate.

This paper places on record a case of breast tuberculosis in a Sudanese woman of about 40 years of age, a native of the remote parts of Khordofan, where she had passed most of her life; where, it would appear, the lesion was first noticed 16 years ago. The patient had come to Khartoum for treatment, and Archibald was enabled through the help of Dr. HODSON, M.V.O., to obtain and examine the breast after removal. The photographs reproduced, and particularly the microphotograph illustrating a single tubercle, are very convincing and, in the opinion of the reviewer, establish the diagnosis; though, unfortunately, no inoculation experiments were carried out. The case is of considerable interest, as it is the first record of mammary tuberculosis yet noted from the Sudan. It is of epidemiological interest, too, in proving the existence of a chronic and well-balanced type of infection in a country where the acute and progressive manifestations of the disease have hitherto been the most commonly observed. The fact that the patient came from Khordofan, a district in which there is a large admixture of Arab blood, and where the Dongola slave merchants had established many trade centres before the days of Gordon, suggests that she may have been exposed in early life to the same conditions of subinfection that are associated with the chronic and "resisted" tuberculosis so often met with in European communities. It should be noted that this patient had a grown-up daughter in good health and free from signs of tuberculosis. A Von Pirquet test applied to the latter might have given interesting information. The author gives a brief description of the disease as met with in the Sudan, expressing views that correspond closely with those recorded by CUMMINS (1908). Points of importance, noted by Archibald, are as follows:—

There is a danger that, as the country develops and town communities grow up, the seeds of tubercle may "grow and be disseminated on what can only be considered a virgin soil."

> "The disease appears to be more prevalent among adult males, but . . . racial customs . . . do not encourage the female population to seek medical advice. . . . The children of the Sudanese appear to be rarely affected. . . . Pott's disease is exceedingly rare, and tubercular meningitis more so. . . . Intestinal tuberculosis occurring as a primary affection of the intestines is exceedingly rare, *as would be expected in a country where animal tuberculosis is non-existent.*"

This paper, though of limited scope, is of great interest. It indicates, yet again, that the Sudan still presents a rich field for investigation on the tuberculosis of isolated communities, a field that will become less interesting and instructive with each year that passes. Where inquiry is needed into such truly tropical diseases as malaria and sleeping sickness, England is always ready to find the men and the money for the work. Is it not strange that in the case of a disease which is one of our own greatest scourges, and the manifestations of which in our crowded industrial centres can only be comprehended in the light of its different behaviour amongst the inhabitants of isolated communities, we leave untouched problems that underlie not only the successful exploitation of coloured labour abroad but the happiness and well-being of our own people at home?

S. L. C.

PANAYOTATOU (Angélique G.). **Quelques cas de typhobacillose en Egypte.**—*Rev. Méd. et Hyg. Trop.* 1922. July–Aug. Vol. 14. No. 4. pp. 108–119.

This paper deals with five cases of tuberculosis, in all of which a period of typhoid-like pyrexia occurred. They are considered by Dr. Panayotatou to illustrate the condition described by LANDOUZY in 1882 as " Typhobacillose," and we agree that they fit in fairly well with the clinical picture to which this term was originally applied. To all engaged in the study of tuberculosis these typhoid-like pyrexias are familiar, though they occur under circumstances so varying, and have such different significance in different cases, that we think it a pity to classify them all under a heading that suggests a more or less pure septicaemia. A perusal of the five cases cited shows clearly how little they had in common except this period of indeterminate pyrexia. With the conclusion of the author, that in these doubtful cases there should be more frequent reference to the laboratory for assistance, we are in cordial agreement.

S. L. C.

i. PROCEEDINGS OF THE TRANSVAAL MINE MEDICAL OFFICERS' ASSOCIATION. 1922. June. Vol. 2. No. 2. pp. 1–3. (Discussion pp. 3–8.)—**Report of the Sub-Committee appointed by the Association to collect Data on the Incidence of, and Mortality from, Tuberculosis and Miners' Phthisis among Natives.**

ii. PROCEEDINGS OF THE TRANSVAAL MINE MEDICAL OFFICERS' ASSOCIATION. 1922. Aug. Vol. 2. No. 4. pp. 1–12.—[**Discussion on Tuberculosis.**]

i. This report of the sub-committee appointed by the Association to collect data on the Incidence of and Mortality from Tuberculosis and Miners' Phthisis among Natives, while brief and, unfortunately, in its published form, without a schedule of the statistical findings referred to in the text, is still a document of the highest interest and importance; while the discussion following the communication of the report to the Association is one that ought to be widely read not only by those interested in tuberculosis but by all those who desire to see the human individuals that constitute the Native Labour Contingents in our Colonies fairly treated.

The report discloses a rapid and terrible increase in the death-rate and repatriation-rate from tuberculosis throughout the mines; and a corresponding increase in the rates for silicosis and tuberculosis with silicosis.

> "For tuberculosis the total number of cases (repatriated and died) in 1916 was 709, or a rate of 52 per 10,000; and in 1920 was 1,138, or 72·5 per 10,000. Similarly, for silicosis, the numbers and rates were as follows:—115 or 8·4 per 10,000 in 1916; 180 or 11·5 per 10,000 in 1920. For tuberculosis with silicosis, they were 100 or 7·3 per 10,000 in 1916; 239 or 15·4 per 10,000 in 1920."

These figures speak for themselves. It is recognized by the sub-committee that, while improved diagnosis has certainly been operative during the period in question, this factor "cannot entirely account for the very marked increases that have taken place." It would indeed be strange if faulty diagnosis had been so marked, in the past, as to lose sight of the true nature of diseased conditions so advanced as to lead to death and repatriation on this formidable scale, and we cannot help reading into the restrained expression of opinion of the sub-committee a note not far removed from irony when they say that improved methods "cannot entirely account" for figures that ought to awaken the liveliest concern amongst all those responsible for the recruiting and employment of native labour in the Transvaal. When we learn, in the discussion, from such an authority as Dr. IRVINE, that half of the total cases of pure tuberculosis are detected in the first six months and that, in his opinion, this means that "half of the total cases are boys with a pronounced lack of immunity to tuberculosis," we are already prepared for his conclusion that this loss occurring shortly after the start of work in the mines is due on the one hand to imported tuberculosis and, on the other, to tuberculosis originating in highly susceptible boys. For a possible explanation we turn to Dr. DODD's contribution to the discussion. He says: "I think it is an example of the most vicious circle that was ever created in any country, and that is that we repatriate a very large number of highly infectious boys to their kraals and then we are surprised when their successors develop tuberculosis at an early stage of work. He adds his view that "if we are going to search for the cause of this increase we must go into the territories," and in that conclusion he is clearly right. Now here is a situation of great interest. The medical men of the Transvaal mines and the highly expert staff of the Bureau for the investigation of the diseases of the miners are at one in calling attention to a terrible mortality from tuberculosis amongst the native workers. It is fully realized that the native recruits to the mines are highly susceptible to the disease. The inference is clear that the repatriation of persons found to be suffering from this infective condition must necessarily be a serious danger to their associates when they regain the crowded and insanitary kraals of their native villages and mix once more with the admittedly highly susceptible populations of the interior. A vicious circle indeed. And yet the obvious remedy is ignored. Dr. ORENSTEIN, in commenting on this point, says:—

> "There are a great many things that might be done in this country that apparently one cannot get done. For instance, we repeatedly urged on the Government the advisability of appointing some persons to go into the Territories and collect actual facts about tuberculosis in the Territories. This was one of the recommendations of the De Villiers Commission. . . . It was put forward again by private members during the present Session and turned down by the Minister of Mines because there was no money, I understand."

It is really about time that those responsible for the lives of large numbers of subject races became aware of their obligation to listen to what the medical profession has to say. The policy of gathering together into the trammels of industrial work large detachments of susceptible persons and repatriating to their native homes the infected victims of a disease that is essentially one that spreads from man to man under home conditions is not, on the face of it, a sound business proposition. On humanitarian grounds, too, something might be said of this "most vicious circle that was ever created in any country."

ii. The discussion now recorded is the outcome of the desire expressed at the former meeting that information as to the actual state of things in the territories from which native mining recruits are drawn, and to which they return if invalided, should be made available. In order to obtain light on this question, it had been decided to invite certain medical and other persons from amongst those working at the examination and selection of recruits in the territories to attend a meeting of the Society, and the guests included Drs. WELSH and ALLEN, Colonel VILLIERS, Chairman of the Native Recruiting Corporation, Ltd., Mr. SMITH, Secretary of the Witwatersrand Native Labour Association, and Major WELSH of the Defence Force.

Dr. WELSH addressed the meeting and gave his views as to the actual conditions in the territories with regard to the medical inspection of recruits, the present distribution of tuberculosis amongst the natives and the question whether there is much danger of spreading infection through the repatriation of tuberculous miners. The degree of precision in detection of early tuberculosis amongst these recruits may be gathered from the description given: "We stethoscope every boy that comes along," "You have to go through from 60 to 100 boys in an hour or an hour and a half and by the time you get to the end the ear is not quite so acute in detecting sound," "Many of the boys have crepitations and other signs in the chest." Now it is undeniable that a physician with experience of natives can weed out the acutely ill in the course of a very rapid inspection, and all who know Africans at first hand will agree that the general condition, the skin, the eyes, the teeth and so forth give admirable indications as to the general fitness of a recruit; but when it is a question of detecting early or even fairly advanced signs of pulmonary tuberculosis, not even that much trusted implement, the stethoscope, can be looked upon as likely to help much when 60 men have to be examined in an hour and a half; to say nothing of 100 in an hour! It is clear from what Dr. WELSH says that the examination is of little use so far as concerns tuberculosis, though it is probable that it serves to weed out the actual weaklings if conducted by a man, such as Dr. WELSH clearly is, of great experience in the inspection of recruits.

Next as to the prevalence of tuberculosis in the territories, here, too, the information available is far from sufficient. To quote Dr. WELSH, "the Native Territories are a large place; they cover an area of something like 17,000 square miles, nearly two-thirds the size of Scotland, with a population of about one million natives scattered over this area, an essentially rural population with no large native towns or cities; and as there are no statistics at all kept, it is impossible to give definite figures of any kind." It must therefore be admitted that nothing precise is known upon this essentially important problem upon which the whole future of the staffing of the mines as well as the health and happiness of a subject race may perhaps depend; and all we can say is that the sooner steps are taken to find out about it the better.

While this absence of exact knowledge is deplorable, the paper read by Dr. WELSH throws much valuable light upon certain aspects of the tuberculosis problem and the impressions of an experienced doctor are often more significant than ill-compiled and badly-collected statistics. It is of great interest to find that the impressions of both Dr. WELSH and Dr. ALLEN are to the effect that the disease is lessening in severity. Dr. WELSH is " satisfied " that he sees " less tuberculosis than ten years ago." Dr. ALLEN says "I can speak for Zululand, which I have investigated very thoroughly, and I can say that tuberculosis is certainly diminishing."

In the discussion which followed, Dr. ORENSTEIN asked the pertinent question as to whether a process of gradual immunization was tending to produce amongst the natives a type of tuberculosis like that met with in Europe. In reply, Dr. WELSH said that at one time tubercolosis " seemed to be spreading so rapidly and seemed so hopeless to deal with " that he thought that the native question would soon settle itself. But he goes on to say " I am satisfied that the type of disease as it exists now is much more like that found in European countries, though I do not think it has reached that type yet."

It is very interesting to speculate as to how far the introduction of infected persons into such a scattered community as the Native Territories can spread disease on the one hand or immunity on the other. We tend to the opinion that the rapidly fatal course of the disease in Africans is likely to lead to a rapid elimination of the infective subjects, thus lessening their powers of spreading infection ; that the open-air life is likely to limit infection to the immediate circle of relatives inhabiting the same kraal as the patient, since close contact will only be possible indoors ; and that the spread of the disease as well as of acquired resistance to it are both likely to be slow. It would seem, indeed, that but little resistance is as yet manifest amongst the natives that come to work in the mines, and it is certain that the Native Labour Corps serving in France were extremely susceptible to tuberculosis. It is probable that, in a population such as that described by Dr. WELSH as inhabiting the Native Territories, a balance of slight but still significant resistance and slowly spreading infection suffices to explain the diminution of cases noted, but that the degree of resistance is far too slight to be of account under the more intense conditions of infection met with at the mines.

S. L. C.

MITCHELL (J. A.). **The Nelspoort Tuberculosis Farm Sanatorium Scheme and Tuberculosis Clinics.**—*Med. Jl. S. Africa.* 1922. Aug. Vol. 18. No. 1. pp. 8–10.

Through the generosity and initiative of Mr. John GARLICK, of Capetown, who gave a sum of £25,000 towards a sanatorium on condition that local authorities contributed a like sum and the Government £50,000, it has been possible to obtain a total of £108,000 and to start work on the building of an institution which should become the nucleus of an important tuberculosis service for the Cape Province in the future. Such a service is urgently needed, since it is estimated that there are at least 4,000 white and 20,000 coloured cases of active tuberculosis in the Union, of which 3,000 white and 15,000 coloured are in the Cape Province. A suitable site has been found in a wide valley in the Nieuweveld Mountains, through which the Salt River flows southward. The sanatorium will accommodate, when completed, about 92 patients, white and coloured ; and the addition of cheap shelters and chalets is contemplated if further beds are found necessary.

To complete the scheme, the organization of tuberculosis clinics and the other adjuncts in use elsewhere will be required, and it is hoped that these will be provided. Such a scheme should afford unexampled facilities for contrasting the manifestations of tuberculosis in Europeans and African natives, a subject on which much information is required for the comprehension of this disease.

S. L. C.

WIEBERDINK (Tj.). **Chirurgische Tuberculose en zee-klimaat in Indië.** [Surgical Tuberculosis and Sea Climate in the East.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 243–252. With 1 text fig.

Wieberdink treated 11 cases of surgical (bone and glandular) tuberculosis by exposure to the sun on the small island of Onrust, near Batavia. In one case the diagnosis was doubtful, in one of the remaining 10 there was no apparent influence, but in the other cases the author noted very favourable results of 5–7 months' treatment. A few of his cases had been treated in the same way in the town of Batavia before without any appreciable effect. The result was better in cases of superficial than in deeper seated affections.

W. J. Bais.

PURDY (J. S.). **Silicosis, Miners' Phthisis and Medical Inspection.**—*Med. Jl. Australia.* 1922. Aug. 26. 9th Year. Vol. 2. No. 9. pp. 234–235.

The author gives, in his initial paragraphs, several quotations from the works of E. L. COLLIS on the relation of silicosis to phthisis and on the preventive action of certain clays in relation to the action of silica in the lungs. A summary of the findings of the Broken Hill Commission on Pneumokonioses is then given, and mention is made of the objections raised by the workers to the introduction of a system of medical examination of miners such as obtains under the Miners' Phthisis Medical Bureau in South Africa. The brief paper finishes with an interesting communication sent to the author by Dr. Watkins PITCHFORD, in which the South African methods and the results obtained are described. The communication concludes as follows :—

> "One is surprised to hear a rumour that there is opposition on the part of the workers in Australia to the principle of systematic medical supervision of the health of the miners. As far as the Witwatersrand is concerned, it is safe to say that any proposal to abolish such supervision would be strenuously opposed by the workers."

S. L. C.

FRY (A. Sargood). **Clinical Pictures of Tuberculosis in Relation to Bones and Joints.**—*Indian Med. Gaz.* 1922. Jan. Vol. 57. No. 1. pp. 7–9. With 1 plate.

This short paper is an account of some cases of surgical tuberculosis treated by the author. They have little or no bearing upon tropical tuberculosis as such, but are of interest as clinical pictures. It is worth noting that, in the first case, one of *caries sicca* of the hip joint in a sepoy, after a most ominous beginning with wasting and emaciation, the patient took a sudden change for the better a month after a dose of sodium morrhuate. As a matter of fact, the drug had been stopped for some reason or other and a course of cod liver oil by the mouth substituted ; but, as pointed out by the author, had the morrhuate been continued, it would have been difficult to avoid attributing the good result to the drug. This little episode serves well to show the need for extensive trials and thorough controls before success is claimed for any given remedy in such a many-sided disease as tuberculosis.

S. L. C.

KOLMER (John A.), DAVIS (Luther C.) & JAGER (Rudolph). **The Influence of Chaulmoogra Oil on the Tubercle Bacillus.**—*Jl. Infect. Dis.* 1921. Mar. Vol. 28. No. 3. pp. 265–269.

The authors worked with oil expressed cold from seeds of *Taraktogenus kurzii* King, and with a strain of bovine tubercle bacilli virulent for guinea-pigs. The technique employed was that of MCMASTER, Petroff's solid medium being substituted for agar slants and 24-day cultures used. The dilutions of the oil were made in sterile paraffin. The 24-day cultures were exposed for 24 hours to the action of the oil, which was poured over them so as to cover the growth, the tubes being kept at 37·5° C. After exposure, the oil was removed and the cultures washed and reinoculated on to fresh tubes of the medium, which were incubated for three weeks and examined. Growth was always obtained. Lest the technique just described might possibly lead to a failure to obtain contact between the chaulmoogra oil and every part of the culture, another method was tried, the bacilli being ground up with sterile paraffin and 0·1 cc. of the emulsion placed in flasks along with 10 cc. of each dilution of the oil. After 18 hours shaking at room temperature the mixture was inoculated into a guinea-pig. Of 13 guinea-pigs so treated all died of tuberculosis. Attempts were made, too, to prevent the development of tuberculosis in already infected guinea-pigs by the inoculation of the chaulmoogra oil, but in vain. The salts of the fatty acids were not tried.

S. L. C.

FERREIRA (Clemente). **Liga Paulista contra a Tuberculose. Exercicio de 1920. Relatorio apresentado á Assembléa Geral na Sessão ordinario de 25 de Maio de 1921.**—75 pp. With 1 chart. 1921. Sao Paulo: Martinelli, Passos & C.

This long and complete report on the working of the " Clemente Ferreira " Model Dispensary, while full of useful information for those engaged on tuberculosis schemes, lends itself but poorly to the purposes of a summary and must be perused in the original to be appreciated. There is one portion, however, dealing with the treatment of pulmonary tuberculosis by means of sodium morrhuate after the method of Sir Leonard ROGERS and Dr. MUIR, which is of immediate interest to the student of tuberculosis, whether in the tropics or elsewhere ; and we shall confine our remarks to this section.

After quoting the article by ROGERS in the *British Medical Journal* of February 8, 1919, and the work of MUIR, KNOWLES, COCHRANE, BRIERLEY and DAVIES [see this *Bulletin*, Vol. 16, p. 193], the author describes his own work with this drug. The observations are based on nine cases, six with more or less chronic bilateral pulmonary tuberculosis and three with severe and progressive disease. Each individual case is minutely described and the progress recorded during treatment. For the most part, the drug was given by intramuscular injection, in doses of ½ to 1 cc. and upwards of a 3 per cent. solution, as used by MUIR. In certain cases, the intravenous route was used, especially where the intramuscular method appeared to give rise to reaction and difficulty. In one case as many as 49 injections were given, in another 36, and so on. In one case (No. 8) the treatment was discontinued after ten injections.

The results in the " balanced " cases were decidedly favourable. Four of the patients were so much improved as to be classified as " arrested," bacilli disappearing from the sputum, the volume of sputum becoming greatly reduced, and the patients gaining in weight and returning to health. In the " progressive " cases little or no good resulted. It would appear that the injections led to no undesirable results, thus contrasting with tuberculin which, in the hands of Ferreira, has sometimes led to trouble. The series of cases, though small, has been well observed and carefully recorded, and it is clear that the results tend to be encouraging in the more favourable clinical types. It must be remembered that it is just such types that often benefit by the advice, assistance and general optimism that goes with attendance at a dispensary, and it is necessary to preserve a critical attitude as to the results obtained by any form of " therapy " that coincides with general attention to the patient's welfare ; but a case has been made out for an extended trial of the morrhuate in pulmonary tuberculosis.

S. L. C.

HEINEMANN (H.). **Antikörperstudien bei Tuberkulose. Die Komplementbindungsreaktion bei Tuberkulose und ihr Malariafehler.** —*Muench. Med. Woch.* 1922. July 14. Vol. 69. No. 28. pp. 1035–1037.

Tuberculosis is rare in Java and the Von Pirquet index is as low as 5–10 per cent. The author has taken the opportunity of trying out the complement-deviation test with old tuberculin as " antigen " in a large number (1,200) of persons free, for the most part, from infection with the tubercle bacillus, but including a number of persons with malaria.

He finds that a large proportion of those with active malaria gives a positive " Tuberculin-Wassermann " (T.W.) reaction, which is of a temporary nature and tends to disappear when the parasites are no longer to be found in the blood. As he points out, this fact must be given careful consideration in interpreting complement-deviation tests for tuberculosis in patients who have been exposed to malaria. That this phenomenon of a positive T.W. reaction during active malarial infection is unconnected with syphilis is shown by the fact, proved by Heinemann, that the " T.W." is often positive when the Wassermann, the Sachs-Georgi and the Meinicke reactions are all negative.

The theories to account for this T.W. reaction in malaria are not very convincing, and for further information about them the original paper should be consulted. From the point of view of tuberculosis, it would have been very interesting to hear from the author how many of the non-malarial and " Von Pirquet-negative " persons examined proved positive and how many negative to the complement-deviation test with tuberculin, and it is hoped that this information may be given in a subsequent communication.

S. L. C.

DE GREGORIIS (Antonio). **Tisis y Tuberculosis. Investigaciones de los Professors Ferrán y Otto von Schrön.**—*An. del. Depart. Nac. Hig.* Buenos Ayres. 1921. May & June. Vol. 27. No. 3. July & Aug. Vol. 27. No. 4. pp. 151–155; pp. 195–197.

We had thought that the old controversy between the "Dualists" and the "Unicists" had died with the work of VILLEMIN and Robert KOCH; but it seems that this is not the case. To those who seek support for the Dualistic view, these brief papers describing the views of Otto von SCHRÖN as to the separate etiology of phthisis and tuberculosis will doubtless appeal. Here they will find set out in tabular form the eleven stages of the phthisiogenic organism of von SCHRÖN. A third communication is promised, and this may perhaps mention some of the evidence that is held to support the association of this pleomorphic germ with phthisis and tabes mesenterica.

S. L. C.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

ERRATUM.

BLANCHARD (M.) & LEFROU (G.). **Présence de spirochètes dans le sang d'européens atteints de fièvre bilieuse hémoglobinurique. Le problème étiologique de cette spirochétose.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 699–722.

As kindly pointed out to me by Prof. MESNIL the review of BLANCHARD and LEFROU's paper in the last issue of the *Bulletin* [Vol. 20. No. 2. p. 139, first paragraph] contains a mistake. The name *Spirochaeta biliohaemoglobinuriae* was proposed by BLANCHARD and LEFROU for the organism which they discovered in order to distinguish it from that described by SCHÜFFNER which was named by him *Spirochaeta icterohaemoglobinuriae.* The review incorrectly states that BLANCHARD and LEFROU's name was the same as that of SCHÜFFNER.

C. M. Wenyon.

HELMINTHIASIS.

NICOLL (William). **Observations on the Occurrence and Prevalence of Parasitic Intestinal Worms during the War.**—*Lancet.* 1922. Nov. 18. pp. 1049–1052.

During the later years of the war the author had several opportunities of making observations on the occurrence of worm parasites in civilians and in soldiers suffering from dysentery and other intestinal infections. About 80 per cent. of the cases coming under routine examination harboured entamoebic cysts. There was a residue of 10 per cent., which did not show infection with either pathogenic bacteria or protozoa, but which harboured parasitic worms which were apparently a causal factor in enteritis. The author makes an exhaustive analysis of the literature of the common intestinal helminth infections (excluding those of military significance which called for special investigations, *e.g.*, Bilharzia), and he concludes that the sanitary authorities are not sufficiently alive to the rôle played by the commoner infestations which too often are dismissed like the measles as " common, and therefore harmless."

R. T. Leiper.

SCHWARTZ (Benjamin) & TUBANGUI (Marcos A.). **Uncommon Intestinal Parasites of Man in the Philippine Islands.**—*Philippine Jl. Sci.* 1922. June. Vol. 20. No. 6. pp. 611–618.

In the course of examinations of more than 500 students of the University of the Philippines, between the ages of 20 and 30 years, the following cases of infestation with platyhelminths were noted.

(*a*) Three cases of Taenia infection of which one was identified as *T. saginata.* Over 1 per cent. of the native hogs are found annually to be infested with *Cysticercus cellulosae* and these are condemned by the public health authorities. No data are available with regard to the incidence of *Cysticercus bovis* in native cattle as these are seldom slaughtered in Manila. The native cattle are consumed in the provinces where there is no meat inspection. The cattle slaughtered in Manila are usually imported from French Indo-China.

(*b*) A case of infestation with *Hymenolepis diminuta,* found in a male student aged 20 years.

(*c*) An imported case of *Clonorchis sinensis* in a Chinese student from Canton is mentioned. The parasite has not yet been recorded from Filipinos.

(*d*) Two new cases of infestation with *Echinostoma ilocanum*; both in students from Luzon.

R. T. L.

MOSS (Emma Sadler). **Nematode Infestation in Patients at United States Veterans' Hospital No. 45, Biltmore, N.C.**—*Public Health Rep.* 1922. June 16. Vol. 37. No. 24. pp. 1457–1458.

Most of the patients examined were veterans of the Great War, and few, if any, had been admitted for treatment of intestinal parasites. Of 597 patients examined, 43 per cent. were infested.

Hookworm	25·4 per cent.	Twenty patients had a double infection and one a triple infection.
Trichuris	7·3 per cent.	
Ascaris lumbricoides ..	6·3 per cent.	
Strongyloides ..	4·0 per cent.	

A comparison is made with results obtained by STILES, who found a total infection of 7·3 per cent., his cases being taken from 23 States, whereas this report dealt almost wholly with patients from 7 Southern States.

R. T. L.

SIMONIN (P.). **Intoxication vermineuse et glandes endocrines.**—*Rev. Méd. de l'Est.* 1922. May 15. Vol. 50. pp. 314–325. With 1 plate. [Summarized in *Brit. Med. Jl.* (Epitome of Current Medical Literature.) 1922. Aug. 19. p. 21.]

Recent work on the action of "foreign proteins" has advanced the knowledge of the toxins resulting from intestinal helminth infections. The toxins giving rise to the observed symptoms include both secretions of the worm and toxic substances resulting from the disordered metabolism of the infected host. Experimental work upon the action of these toxins upon the endocrine organs is in full accord with the results of clinical observations. The author considers that toxic cellular degeneration of the liver, pancreas and suprarenals, gives rise to a glandular insufficiency resulting in an interference with the oxidation of carbohydrates and hydrocarbons; which accounts for the rapid emaciation often observed in cases of infection with intestinal worms. This condition is often accompanied by excess of nitrogen bodies and phosphates in the urine, indicating abnormal tissue katabolism. Cachexia may be due to the dual effect. In children and young persons growth and development may be seriously interfered with, and infantilism attributable to ankylostomiasis has been noted in Tunis and Porto Rico. He considers that the worms have a definite toxic action on the ovaries, resulting in the menstrual disorders often recorded in connexion with helminthiases; further, even after removal of the worms the toxic effect has caused numerous abortions recorded by TRIDONDANI. Comparative pathology is quoted, and a number of plates illustrate the degenerative changes produced in the endocrine organs by infections of fluids from hydatid cysts, ascarids, etc.

R. T. L.

GUILLAIN (Georges) & GARDIN (Ch.). **Contribution à l'étude des méningites de l'helminthiase.**—*Bull. Acad. Méd.* 1922. Mar. 14. Vol. 87. No. 11. pp. 308–316.

A study is made of the cerebrospinal fluid of a case of pseudomeningitis of known helminthic origin. A girl, aged 19 years, had been infected with a taenia for six months, but as she was pregnant she had not attempted to expel the worm. A normal labour in October resulted in a living child. Severe frontal headache and vomiting began December 15 and she was admitted five days later. Her condition resembled tubercular meningitis in every respect save the absence of the Koch bacillus in the cerebro-spinal fluid; the symptoms persisted until January 3, when, after a vermifuge was given, immediate improvement was observed and in one week she was completely cured.

R. T. L.

GIRBAL (E.). **Les pseudo méningites vermineuses de l'enfant.**—*Gaz. des Hôpit.* 1922. Mar. 25. Vol. 95. No. 24. pp. 373–376.

The characteristics of pseudo-meningitis due to helminthiasis are:—

(*a*) Sudden crisis without high fever.

(*b*) Absence of the characteristic cry, of colouration of the cheekbones, and of coma.

(*c*) Rarity of strabismus and of complete loss of intelligence.

(*d*) Patient is in apparently good health between the attacks.

(*e*) Lumbar puncture shows slight hypertension of cerebro-spinal fluid, but no bacteria or albumin.

The diagnosis is made by the examination of :—

(*a*) The stools for helminth ova, and after an anti-helminthic, for the worms themselves. Charcot-Leyden crystals may be looked for.

(*b*) The urine treated with acid mercuric nitrate, is found by DEFINIOR to give a characteristic reaction.

(*c*) Differential leucocyte count shows marked eosinophilia.

The differential diagnosis is made on the following points :—

Tetanus and cerebro-spinal fever are distinguished readily. The presence of bacteria in the cerebro-spinal fluid and the absence of a cellular reaction indicates septic meningitis. Presence of blood in the cerebro-spinal fluids points to haemorrhagic meningitis. The differentiation from tubercular meningitis is difficult ; an examination of the stools and blood is essential in all cases.

The paper opens with an historical summary and closes with a bibliography ranging over the last 50 years.

R. T. L.

USAMI (Kenichi) & KAMADA (Ryonosuke). [**Question on the Use of Gauze Filters in the Collection of the Eggs of Human Parasites.**]—*Iji Shimbun* (*Medical News*). 1921. Feb. No. 1613. [Summarized in *Japan Med. World*. Tokyo. 1921. June 20. Vol. 1. No. 2. p. 23.]

Gauze filters will retain on their surface two-thirds of the eggs from a watery emulsion filtered through them. The proportion appears unaffected by the concentration of eggs in the emulsion, by one or two thicknesses of gauze, by the addition of chemicals, or by the use of refined cotton.

R. T. L.

HENRY (T. A.). **Some Recent Work on Anthelmintics.**—Reprinted from *Jl. Soc. Chemical Industry*. 1922. Nov. 15. Vol. 41. No. 21. pp. 467r–469r.

This is a review of the attempts to produce synthetic anthelmintics ; most of these compounds are phenol derivatives, especially phloroglucinols and resorcinols. FRÄNKEL suggested that butyric and isobutyric residues were found in most anthelmintics. KARRER, working on these lines, though erroneous, has prepared many acyl derivatives of the phenols ; the best being reso*iso*hexophenone and phloro*iso*hexophenone. The naturally occurring compounds of this class increase in anthelmintic efficiency, but the synthetic compounds become less active with increasing complexity of the molecule. Probably all simple mono-, di- and tri-hydroxy phenols are anthelmintics ; their therapeutic value depending on their relative absorption by, and toxicity for, the host. Attempts have been made to diminish this toxicity by the esterification of alkyl phenols ; but most of the esters and all the ethers are quite useless. Dr. SMILLIE found the only active constituent of Chenopodium oil to be the organic peroxide ascaridole. The dimethyl-naphthalene ring in santonin may be replaced by a benzene, or a substituted benzene ring; substitution with alkyl groups increasing, and with aryl groups diminishing, the efficiency. The activity of santonin is attributed, by LAUTENSCHLÄGER and TRENDELENBURG, to the lactone ring; and basing their conclusions on experiments with worm musculature, they state that the sodium salt is inactive. Nevertheless, the introduction of a second lactone ring diminishes the anthelmintic action; and salts of santonic acid have been used in therapeutics, though the toxicity of the sodium salt has caused it to be abandoned.

R. T. L.

MCVAIL (J. Borland). **Carbon Tetrachloride in Helminthiasis. A Preliminary Note.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 290–291.

In addition to the known value of carbon tetrachloride in hookworm, evidence is given that it is of great value against oxyuris, but of little use for ascaris, trichuris and *Hymenolepis nana.* The dose used for adults was 60 minims, given in some cases on two successive days, and sometimes in castor oil to obviate the use of the expensive hard gelatine capsule. No starvation or purgative was enforced, the drug was taken usually two hours after a meal and four hours were allowed to elapse before the next meal. This drug is recommended for ankylostomiasis in cases of kala azar when chenopodium is contra-indicated.

R. T. L.

HALL (Maurice C.). **Carbon Tetrachloride as an Anthelmintic.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No 5. pp. 373–379.

Carbon tetrachloride is an efficient anthelmintic for blood-sucking strongyles and certain other nematodes, but used alone it is not effective for tapeworms though in combination with thymol it acts well. Toxic impurities to be guarded against are phosgene ($COCl_2$) and carbon bisulphide (CS_2). It is very important to prevent inhalation, so the drug is best administered in hard gelatine capsules. No purge is needed as peristalsis is increased by carbon tetrachloride and the drug is very little absorbed in the small intestine. Castor oil should never be given when capsules are used. If desired a saline purge is advised three hours after the capsules are taken.

R. T. L.

LAKE (G. C.). **Carbon Tetrachloride. A Drug proposed for the Removal of Hookworm, with Special Reference to its Toxicity for Monkeys when given by Stomach Tube in Repeated Doses.**—*Public Health Rep.* 1922. May 12. Vol. 37. No. 19. pp. 1123–1126.

The administration of large repeated doses of carbon tetrachloride to four monkeys showed that the drug produced no untoward symptoms when administered by a stomach pump. Two animals were later killed and no macroscopic or microscopic lesions of the viscera were observed. Stress is laid on the importance of giving the drug in hard gelatine capsules to prevent inhalation, and on the fact that no purgative is necessary at the time or subsequent to the administration of carbon tetrachloride, since this drug tends to increase peristalsis. The doses employed were 10 to 40 times the dose per kilo of body weight for man and were repeated 12–16 times.

R. T. L.

DOCHERTY (J. F.) & BURGESS (E.). **The Action of Carbon Tetrachloride on the Liver.**—*Brit. Med. Jl.* 1922. Nov. 11. pp. 907–908.

Availing themselves of the opportunity of administering carbon tetrachloride to three condemned men, the authors gave 5 cc. in two instances and 8 cc. in the third (in two doses) on an empty stomach, followed by a saline purge, three and a half hours later in the first case and eight hours later in the second ; the third received none. At the autopsies, from 6 to 14 days later, in case 1 the liver was normal, in cases 2 and 3 there was granular (2) and fatty (3) degeneration of the liver cells. The authors conclude that the 5 cc. dose is on the danger line, and advise 3 cc., which they have given in many instances in Ceylon. They agree with other observers that the drug is practically specific for ankylostomes, and fairly efficient in the removal of round and thread worms.

A. G. B.

ANNANDALE (N.) & SEWELL (R. B. Seymour). **Progress Report on a Survey of the Freshwater Gastropod Molluscs of the Indian Empire and of their Trematode Parasites.**—*Indian Jl. Med. Res.* 1920. July. Vol. 8. No. 1. pp. 93–124.

The hill stations of India are singularly free from aquatic molluscs. There is danger, however, that they may be brought from the plains as food for introduced fish. In the plains the predominant genera are *Bythinia, Vivipara, Limnaea, Gyraulus, Pachylabra, Melanoides, Cremnoconchus, Mysorella,* and *Camptoceras* in the Gangetic plain.

R. T. L.

BAKER (Frank Collins). **Fluke Infections and the Destruction of the Intermediate Host.**—*Jl. Parasit.* 1922. Mar. Vol. 8. No. 3. pp. 145–147.

Attention is drawn to the fact that, whilst CHANDLER's suggestion for eradicating the snails which serve as intermediate hosts in fluke infections of man and animals by the use of copper sulphate is admirably adapted to small and isolated bodies of water, its general application to streams would rapidly eliminate all the fish and also the fresh water-mussel.

R. T. L.

NOC & NOGUE. **Parasitisme hépatique chez les indigènes de l'A.O.F.**—*Bull. Soc. Méd.-Chirurg. Française de l'Ouest-Africain.* 1920. June. Vol. 2. No. 6. pp. 171–172.

In a note written from the Central Native Hospital at Dakar in West Africa two cases are recorded of *S. haematobium* and a case in which there were the characteristic eggs of *Dicrocoelium lanceatum* in a Senegalese.

R. T. L.

i. TANABE (Hiroshio). [**Studies on the Trematodes with the Fresh Water Fish as the Intermediate Host. I.** *Stammosoma armatum* **n.g. n.sp.**] —*Kyoto Igakkwai Zasshi* (*Jl. of Kyoto Med. Soc.*). 1922. Apr. Vol. 19. No. 3. [Summarized in *Japan Med. World*. Tokyo. 1922. Sept. 15. Vol. 2. No. 9. pp. 263–264.]

ii.——[**Studies on the Trematodes that** [**use**] **the Fresh Water Fish as their Intermediate Hosts. II. On the Japanese** *Echinochasmus Perifoliatus* (**Râts**).]—*Okayama Igakkwai Zasshi* (*Jl. Okayama Soc.*). 1922. Apr. No. 387. [Summarized in *Japan Med. World*. Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 270.]

i. Encysted cercariae occurring in certain species of Cyprinidae develop to adult worms in about a week after feeding to dog, rabbit, rat, mouse and man. The cat and an [unnamed] bird are said to be the natural definitive hosts. The species is named "*Stamnosoma armatum*" n.g., n.sp., but no description is given in the translation. The eggs are said to resemble those of *Clonorchis sinensis* very closely.

ii. The trematode *Echinochasma perfoliatus* Rátz occurs in the cat in Okayama. The encysted cercaria occurs in the gills of 11 species of fresh water fish. The dog and cat are readily infected and the author has succeeded in infecting himself voluntarily.

R. T. L.

CORT (William W.) & YOKOGAWA (Sadamu). **A New Human Trematode from Japan.**—*Jl. Parasit.* 1921. Dec. Vol. 8. No. 2. pp. 66–69. With 1 plate.

In Japanese literature, written in Japanese orthography, are many important observations which have not come under the notice of Aryan students. Among these is a paper published in Japanese in 1915 by ONJI and NISHIO describing the structure and life-history of a new fluke, *Heterophyes nocens*. This parasite closely resembles *H. heterophyes*. It varies from 0·9 to 1·1 mm. in length and 0·4 to 0·52 mm. in breadth. There are about 60 rodlets guarding the common genital pore. The sizes of the body and of the suckers differ from those of *H. heterophyes*. The rodlets are fewer and the intestinal caeca in the adult are unequal in extent. The cutaneous spines have no serrations on their free margins. The encysted cercaria occurs in *Mugil cephelus* and were identified by successful feeding experiments. [The title is misleading; this paper gives a transliteration of the results of ONJI and NISHIO's work.]

R. T. L.

LANE (Clayton). **A Note on** *Heterophyes nocens* **as a Distinct Species of Trematode Parasite.**—*Lancet.* 1922. Sept. 2. p. 505.

Commenting upon the recent paper [see above] by CORT and YOKOGAWA on *H. nocens*, Onji and Nishio, 1915, the author gives reasons which lead him to confirm LEIPER's view that this species is identical with *H. heterophyes*. Measurements are given based upon material from a Japanese patient treated apparently in the Albert Dock Hospital. It was from several cases in the same hospital that LEIPER originally reported the occurrence of *H. heterophyes* amongst Chinese and Japanese.

R. T. L.

CORVETTO (Anibal). **Paragonimiasis pulmonar.**—*Cronica Méd.* Lima. 1921. July. Vol. 38. No. 697. pp. 246–252.

The author gives three reasons for recording a case of *Paragonimus westermanii* infection: (1) its rarity, this being the sixth recorded in his country; (2) to point out the means by which the spread of the condition can be prevented; (3) because of its value to clinicians disposed to regard all haemoptysis as tuberculous in origin.

The patient was a mechanical engineer who served in 1916 in a submarine and later on a cruiser. In 1917, when living in La Libertad, temporary attacks of haemoptysis occurred, with a certain amount of constitutional disturbance lasting for several days, but these cleared up. A troublesome dry cough recurred in the intervals, and there was blood-stained mucoid expectoration during the attacks.

In December, 1919, beyond a slightly altered percussion note and a few sibilant rhonchi, there were no physical signs of importance. Four and a half months later numerous ova of *Paragonimus westermanii*, but no tubercle bacilli, were found in the sputum.

H. Harold Scott.

ANDO (Ryo). [**Studies on the Determination of the First Intermediate Host of** *Paragonimus westermanii.*]—*Chuo Igakkwai Zasshi* (*Jl. of Central Med. Soc.*). 1921. Mar. No. 155. [Summarized in *Japan Med. World.* Tokyo. 1921. July 15. Vol. 1. No. 3. p. 23.]

The miracidia hatched experimentally from eggs of *P. westermanii* attack and penetrate into the body of a freshwater snail [not specified]. The larvae metamorphosed in the snail into sporocysts.

R. T. L.

SUYEMORI (Susumu). [**On the Pathology of the Parasitism of** *Paragonimus westermanii* **in the Orbital Cavity and the Lid (II. Report).**]—*Taiwan Igakkwai Zasshi* (*Jl. of Formosan Med. Soc.*). 1922. July. No. 223. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 333.]

Successful experimental infestation is recorded, and its pathology described with minute particulars of the microscopic appearances.

R. T. L.

IKEDA (Seiichi). [**Contributions to the Knowledge of Cerebral Soft Cyst and Proliferation of the Glia in the Cerebral Foci in Pulmonary Distomiasis.**]—*Jukwa Zasshi* (*Jl. of Pediatrics*). 1922. July. No. 266. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 330.]

Paragonimus migrating to the brain, apparently by way of the tissues around the cervical blood vessels and nerves, was found to be the cause of a cerebral soft cyst.

R. T. L.

ANDO (Ryo). [**Can Immunization be obtained by the Infestion of** *Paragonimus westermanii*?]—*Iji Shinbun* (*Med. News*). 1921. May. No. 1070. [Summarized in *Japan Med. World.* Tokyo. 1921. Sept. 15. Vol. 1. No. 5. pp. 16–17.]

By repeated feeding of encysted cercariae of *P. westermanii* to dogs already infested with adult flukes, the number of flukes developing from the fed larvae became smaller and smaller. The puppies born of the infested mother-dog were fed with encysted cercariae and were found to be infested with the flukes, but these flukes did not reach the lung but were almost always found lying free in the body of the dogs. This fact appears to the author to indicate some immunological relation.

R. T. L.

MURASHIMA (Tanehide). **[On the Therapeutic Efficacy of Emetin Hydrochloricum against Pulmonary Distomiasis.]**—*Kenyokwai Zasshi* (*Jl. of Kenyo Med. Soc.*). 1922. May. No. 158. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2, No. 10. p. 305.]

The intravenous injection of emetine hydrochloride in a case of pulmonary distomiasis resulted in the reduction of expectoration and the disappearance of haemoptysis. Changes in the eggs were noticeable.

R. T. L.

ANDO (Ryo). **[A Supplementary Notice on the Prevention and Elimination of Pulmonary Distomiasis.]**—*Nippon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiological Soc.*). 1921. Feb. Vol. 15. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1921. June 20. Vol. 1. No. 2. p. 19.]

The destruction of the molluscan intermediary can be most effectively attained by the use of natural enemies, *i.e.*, by ducks and carp. The eggs of the parasite are destroyed by mixing the sputum with human urine and allowing the mixture to putrefy. At room temperature 2 per cent. ammonium bicarbonate will kill all the eggs in 20 days.

R. T L.

PORTER (Annie) & PIRIE (J. H. Harvey). *Clonorchis sinensis*, **the Human Liver Fluke, found in a Chinaman in Johannesburg, with Notes on the Pathology of the Case.**—*Med. Jl. S. Africa.* 1922. July. Vol. 17. No. 12. pp. 240–244. With 2 text figs.

A detailed description of the parasite, which does not seem to have presented any unusual characters, together with its life-history, forms the first half of this paper.

The pathology of the case is fully described. The liver was greatly enlarged and the right lobe contained a huge mass of faint yellowish, nearly spherical, new growth ; other nodules were distributed throughout the liver. The rest of the organ had the appearance of Laennec's cirrhosis, with the fibrous bands poorly developed ; and in some ways it resembled Hanot's cirrhosis. A comparison is made with five cases described by MEBIUS. In this case dilation and fibrosis of the ducts were absent, but in MEBIUS's case many more parasites were found in this location, which may account for this. The growths were malignant adenoma, and it is suggested that the toxic effect of the worms produces cirrhosis, an attempted regeneration of liver tissue results in over-compensation and abnormality, and a carcinoma results, " although no very definite evidence of the regeneration of liver cells was actually observed in the sections made of this case."

R. T. L.

KOSAKA (Keiji). [**On the Prevalence of Liver Distomiasis in Gifu Prefecture.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Igakkwai Zasshi*). 1922. Mar. Vol. 29. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Aug. 15. Vol. 2. No. 8. pp. 243-244.

In the counties of Inaba, Motosu, Ampachi and Kaidzu, encysted larvae of *Clonorchis sinensis* were found in *Pseudorasbora parva,* and cercariae of the same species in *Bythinia striatula* var. *japonica,* and the conclusion is drawn that these localities are infested with *C. sinensis.*

R. T. L.

MUTO (S.) & KOSHIWO (S.). [**On the Distribution of** *Clonorchis sinensis* **in Miye Prefecture.**]—*Chuo Igakkwai Zasshi* (*Jl. of Central Med. Soc.*). 1921. Jan. Vol. 28. No. 1. [Summarized in *Japan Med. World.* Tokyo. 1921. May 15. Vol. 1. No. 1. p. 25.]

The authors collected specimens of *Bulinus* [? *Bythinia*] *striatulus japonicus* and of *Pseudorasbora parva* in the Miye Prefecture; all harboured the cercaria of *Clonorchis sinensis.* Experimental infestations of dogs, rabbits and guinea-pigs were successful.

R. T. L.

MUTO (Masatomo). **On the Duration of Life of** *Clonorchis sinensis* **infecting the Animal Body.**—*Japan Med. World.* Tokyo. 1922. Aug. 15. Vol. 2. No. 8. pp. 224–226.

After two years the parasites appear normal. Three dogs survived this period and in these the parasites all showed signs of senile decay. *Case* 1: 2 years, 8 months (after infection), the worms were small and thin and some were atrophied. *Case* 2: 3 years, 4 months, as Case 1, with more marked atrophy of generative organs. *Case* 3: 4 years, 1¾ months after first infection, eggs were no longer found in the faeces but over 100 worms were found at the autopsy. Some were dead, and in others the viscera were so degenerate as to be scarcely visible. A few were in the same state as Cases 1 and 2; these may have been worms from the second infection 3 years, 6½ months before death.

This work shows that the duration of life of the worms infesting an animal at the same time varies, but that the majority show signs of degeneration after 2½ years and gradually die, passing out by the common bile duct into the intestine.

R. T L.

MUKOYAMA (Takayuki). [**Experimental Study on the Transmigration Route of the Liver Distome in the Body of the Final Host.**]—*Aichi Igakkwai Zasshi* (*Jl. of Aichi Med. Soc.*). 1922. Mar. Vol. 29. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Aug. 15. Vol. 2. No. 8. p. 243.]

Encysted larvae were fed to 58 rabbits, 3 dogs and 3 guinea-pigs, and after six hours, the minimum period which elapsed before examination, freed larvae were found in the bile duct and nowhere else. Hence it is concluded that the larvae are freed in the duodenum and migrate directly along the bile duct.

R. T L.

TOIDE (Gumpei). **[On the Blood Feature in a Case having Infection from *Opisthorchis sinensis*.]**—*Okayama Igakkwai Zasshi* (*Jl. of Okayama Med. Soc.*). 1921. May. No. 376. [Summarized in *Japan Med. World.* Tokyo. 1921. Sept. 15. Vol. 1. No. 5. pp. 25–26.]

The bloods from 38 cases of *Clonorchis sinensis* were examined and it was found that :—

(*a*) Anaemia was rare and never severe ;

(*b*) Leucocytosis was absent and eosinophilia only present in 24·3 per cent. ;

(*c*) No pathological characters were observed in any of the blood cells.

Such changes as occurred were not related in severity to the number of eggs of the parasite, and no pathological changes were produced by the injection into rabbits of either emulsions of the worm or alcoholic extracts of patients' urine.

R. T. L.

GESTEIRA (Martagão). **Um caso de schistosomose com manifestacões cutaneas.** [A Case of Schistosomiasis with Cutaneous Manifestations.]—*Brasil Médico.* 1922. May 6. Year 36. Vol. 1. No. 18. pp. 230–233.

A detailed account is given of a boy, 10 years of age, with an irregular papular eruption, yellowish red in colour, suggestive of urticaria but unassociated with any itching. The lesions were limited to the limbs and almost exclusively to the flexor aspects of them. Some of the papules disappeared in three to four days; others persisted for several weeks. The Wassermann reaction was definitely positive and the diagnoses made were syphilis, leprosy, and morphoea in turn. Finally, recalling a previous patient, a child of 6 years, Professor Gesteira had the faeces examined and "abundant ova of schistosomes" were reported present. [The variety is not stated.] Treatment with tartar emetic intravenously led to the rapid disappearance both of the ova and the eruption after the fourth injection. Treatment, however, was continued till ten had been given. [Neither the size of the individual doses nor the total amount administered is mentioned.]

H. Harold Scott.

BUXTON (P. A.) & KRIKORIAN (K. S.). **On Schistosomiasis in Palestine.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 162–166.

Urinary schistosomiasis occurs in a number of places around Jaffa. The disease was not observed, except as a rarity, until Dr. A. FELIX drew attention to its prevalence among Jewish schoolboys early in 1921. Of 318 boys attending school in Jaffa the authors found 20, *i.e.*, 6·25 per cent., infected; 5 out of 32 boys at Sheikh Muwannes, 2 out of 40 at Sulameh, 1 amongst 55 at Richon le Zion, and 3 in 25 at Kefr Uria and Beit Jiz were positive. In several other villages in the Jaffa area no cases were seen. Haifa, Jericho, Khedera, and Akka proved free. Specimens of snails belonging to the species *Isodora* (*Bullinus*) *contorta* (64), *Melanopsis prerosa* (45), *Melania tuberculata* (31), *Theodoxis anatolica* (15), *Limnaea peregra* (2) were dissected.

In *B. contortus* only were schistosome cercariae discovered ; 6 were positive out of 64. The mollusc does not appear to frequent the River Auja, but occurs in tanks, cisterns and marshes connected with it. Copper sulphate diluted to 1 per million in the hard waters of Jerusalem and Jaffa killed the bilharzia intermediaries in 72 hours, while 1 in 100,000 was effective in 48 hours.

R. T. L.

POMMÉ & SABAGH (Abdel-Kader). **Un cas de bilharziose vésicale à Damas traité par l'antimoine en injections intraveineuses.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 695–698.

The author records for the first time the occurrence of *S. haematobium* in the state of Damascus.

R. T. L.

BRUMPT (E.). **La Bilharziose au Maroc. Répartition du** *Bullinus contortus* **et du** *Planorbis metidjensis.* **Etude épidémiologique comparée du foyer tunisien de Gafsa et du foyer marocain de Marrakech.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 632–641. With 2 text figs.

The habitat of *B. contortus* has been investigated in Morocco, without elucidating the factors governing the prevalence of this mollusc. Attention is drawn to the high percentage of endemic cases of bilharziasis among the Arab population in Gafsa (Tunis) where *B. contortus* is rare ; and the low incidence in the population of Marrakech, where *B. contortus* is very common. It is suggested that whilst the former population is rural in its occupations, the latter is urban and so less exposed to infection ; this applies particularly to the children who play in the oases and perform agricultural work at Gafsa.

R. T. L.

PIRIE (J. H. Harvey). **Hepatic Carcinoma in Natives and its Frequent Association with Schistosomiasis.**—*Med. Jl. S. Africa.* 1921. Dec. Vol. 17. No. 5. pp. 87–97. With 8 figs ; and *S. African Med. Rec.* 1922. Jan. 14. Vol. 20. No. 1. pp. 2–8.

During the past nine years 36 unequivocal cases of primary liver carcinoma have been diagnosed by the staff of the South African Institute for Medical Research. This number is large, especially when the proportion to other forms of malignant disease amongst natives is considered. It is the commonest form of carcinoma met with in natives, whereas this constitutes in European statistics but an insignificant proportion.

Primary carcinoma of the liver in Europeans most commonly develops in a cirrhotic liver and in most of the African cases reviewed *in extenso* by the author cirrhosis was present. In ten of the 36 cases schistosomiasis was definitely established and, as this infection is known to induce hepatic cirrhosis, it is presumed that schistosomiasis plays an important part in the etiology of hepatic carcinoma in South Africa.

R. T. L.

KAZAMA (Y.). **[Intestinal Cancer and Parasites' Ova.]**—*Gann.* Tokyo. 1921. Aug. Vol. 15. No. 3. p. 22. [Summarized in *Jl. Amer. Med. Assoc.* 1921. Nov. 26. Vol. 77. No. 22. p. 1778.]

Intestinal cancer seems to be much more prevalent in the regions infested with *Schistosoma japonicum* than elsewhere. In his nine cases the author found old ova in the neoplasm, especially at the margin of the growth. The mechanical and toxic injuries from them may have set up the irritation inducing the malignant disease.

R. T. L.

DE JONG (D. A.). **Levertrematoden en kanker.** [Liver Trematodes and Cancer.]—*Tijdschr. v. Vergelijke Geneesk. enz.* [1921.] Vol. 6. No. 4. pp. 1–27. With 19 text figs. [French and English Summaries, pp. 25–26.]

The author gives the following summary of his conclusions :—

> " In the cases of invasion of the liver of man and different animals by Distomidae a peculiar glandular hyperplasy of the epithelium of the bile-ducts, often atypical, is characteristic, but the hyperplasy has not the signification of a malignant tumour. Certainly, notwithstanding the sometimes serious histological aspect, the character of the neoformation is benign with tendance to regression and recovery, if the Distomidae only disappear. And when they do not, and serious symptoms are the result, then those are not the consequence of cancerous alterations, but of others, localized or more generalized, which also are to attribute to the parasitism of the worms."

The paper is illustrated by 19 interesting microphotos.

R. T. L

JOSÉ QUINTINI (M.). **Algunas observaciones sobre la Bilharziosis y su tratamiento.** [On Schistosomiasis and its Treatment.]—*Gac. Méd. de Caracas.* 1921. Mar. 15. Vol. 28. No. 5. pp. 56–59. With 2 charts.

Nine cases of infection with *Schistosoma mansoni* were treated with injections of tartar emetic, beginning as a rule with 2 cgm. and increasing by 2 cgm. at each subsequent injection. In seven of the nine patients the ova were not found again while under observation. Another left hospital greatly improved, but at the last examination of the faeces one ovum was seen ; the remaining patient, in spite of daily injections of the drug, died unrelieved six days after entering the hospital. The maximum dose given to any patient was 15 cgm., and the highest total amount 108 cgm.

Nausea, shivering, or a painful cough were not common, and diminished if a teaspoonful of syrup of codeine was given an hour before the injection.

H. Harold Scott.

CARRASQUILLO (H. F.). **Casos de Shistosomiasis mansoni y su tratamiento con tartaro emetico.**—*Bol. Asoc. Med. de Puerto Rico.* 1922. Feb. 28. Vol. 16. No. 135. pp. 15–17.

Bilharzia disease is confined to certain districts in Porto Rico and is often mistaken for dysentery. Heavy infection occurs in Utuado. Twelve cases have come under the author's observation.

Diagnosis in all cases was made by microscopical examination, with discovery of lateral-spined eggs. Tartar emetic was first administered by the author in 1920, in view of results obtained by CHRISTOPHERSON.

Only six received a complete series of injections. Reaction was manifested as *mareos* (sea-sickness), epigastric pain, oppressive sensation in chest, cough, vomiting, ache in bones, fever, and occasionally diarrhoea.

Of six cases treated five were cured, with complete disappearance of symptoms, no eggs being discovered in faeces on repeated examination.

R. T. L.

WILSON (H. F.). **Rectal Administration of Tartarated Antimony in Bilharziasis.**—*Brit. Med. Jl.* 1922. Jan. 28. pp. 137–138.

Four cases are quoted to show that intrarectal administrations of tartarated antimony are in no way inferior to intravenous injections in the treatment of bilharziasis. It economizes time and is free from all risk. Nausea and vomiting occur less frequently than when the drug is run into the general circulation. One of the cases received 35 grains in five days without showing any symptom of intolerance. The drug was given in one or two ounces of warm water per rectum through a funnel with a No. 12 rubber worm catheter attached.

R. T. L.

i. MAYER (Martin). **Zur Behandlung der Bilharzia-Krankheit mit Emetin.** [Emetine Treatment of Schistosomiasis.]—*Wien. klin. Wochenschr.* Year 35. No. 3. Jan. 18. 1922. p. 59.

ii. TSYKALAS. **Erwiderungen auf obige Bemerkingen des Prof. Martin Mayer.** [Reply to the Observations of Professor Mayer.]—*Ibid.* p. 60.

i. In reference to TSYKALAS' article [this *Bulletin*, Vol. 19, p. 214] Mayer claims priority in the use of emetine for this disease, saying that he recommended it and gave it subcutaneously in 1915. He declaims strongly against the description of treatment by antimony as " barbarous," stating that in his experience it is superior to emetine.

ii. Tsykalas states that TSAMIS of Alexandria treated cases with emetine in 1913 and that he himself gave it intravenously in 1914. In support of his statement that antimony treatment is " barbarous " he quotes a case in which he gave a total of 0·74 gm. of tartar emetic ; " the patient died 11 days after the last injection, although he was cured of his bilharziasis." Moreover, only 60 per cent. of his cases were cured by antimony. Another advantage claimed is that if emetine is badly borne the effects are less severe and more easily controlled than those arising from the use of tartar emetic.

R. T. L.

LEBAS (Geraldine Z. L.). **Of the Nature of the Antigen in the Complement-Fixation Test for Bilharziosis.**—*Jl. Trop. Med. & Hyg.* 1922. Mar. 1. Vol. 25. No. 5. pp. 49–54.

The activity of the antigen obtained from bilharzia-infested molluscan livers is to be attributed to a substance of a protein class or to some active principle associated with protein as yet unidentified and unclassified. It seems unlikely that it is lipoidal in character since it is not present in extracts of snails' liver dried with acetone, made with absolute alcohol. The substance is soluble in 50 per cent. alcohol diluted with physiological saline, and can be extracted from the residue of the livers after previous treatment with acetone and absolute alcohol.

R. T. L.

CAWSTON (F. G.). **The Experimental Infestation of Fresh-Water Snails, with Special Reference to the Bilharzia Parasite.**—Reprinted from *S. African Jl. of Sci.* 1922. June. Vol. 18. Nos. 3 & 4. pp. 396–399.

Thirty-three days after infection with miracidia of *S. haematobium* laboratory-reared *Physopsis africana,* measuring 10 mm., contained cercariae, while on the 35th day free-swimming cercariae were being discharged from Physopsis only 9 mm. long. Attempts made at the same time to infect *Limnaea natalensis* proved negative. In June of 1922 the author came across a boy who had acquired infection with *S. mansoni* from bathing in pools at Mayville and Sydenham, Natal.

R. T. L.

CAWSTON (F. G.). **Fresh-Water Snails responsible for the Spread of Bilharzia Disease in Portuguese East Africa.**—*Jl. Trop. Med. & Hyg.* 1922. Oct. 2. Vol. 25. No. 19. pp. 305–306. With 1 text fig.

Specimens of *Isidora* (*Physopsis*) *africana* (?) and *Planorbis pfeifferi* living in the pools in the Municipal Gardens of Lourenço Marques harbour bifid-tail cercariae of various kinds " some of which resembled *S. haematobium.*" Bilharziasis is common in this region.

R. T. L.

FRANÇA (Carlos) & DE MELLO (Froilano). **Bilharziose em Portugal e na India.**—*Med. Contemporanea.* 1921. Aug. 28 & Sept. 4. Vol. 39. Nos. 35 & 36. pp. 273–275 ; 281–284.

An introductory letter from Dr. Carlos França states that 17 autochthonous cases of bilharziasis have been detected in the Portuguese province of Algarve and expresses the opinion that the mollusc which serves as a host to the Schistosoma in Portugal will prove to be *Planorbis corneus* var. *metidjensis,* Forbes. He states further that the miracidia show a marked attraction for this variety of *P. corneus* and that he has watched the penetration of the tissues of this mollusc by numerous miracidia. Experiments made with other Portuguese mollusca, Physas, Limnaea, etc., gave uniformly negative results.

In discussing the question of bilharziasis in Portuguese India (Goa) de Mello states that in 1912 troops recruited in Mozambique began to be sent to Goa and that he is convinced that it was then that bilharziasis was introduced into the colony. Its existence was not suspected until 1914, though an intense eosinophilia was observed in some of the troops. In 1914 a soldier recently arrived from Africa suffering from a pseudo-dysentery supposed to be tuberculous was reported by the laboratory to be a victim of bilharziasis. A coprological examination of the whole company was at once made and

24 out of 110 soldiers were found to be infected by *S. mansoni.* A fresh examination was made six months later and 48 men were found to be bearers of *S. mansoni.* There was no case of *S. haematobium* infection. In British India, on the contrary, *S. haematobium* is the organism uniformly found. The responsibility attaching to Portuguese India under these circumstances is obvious.

The following conclusions have been reached by the author :—

1. Of the native women living with the African troops, some for a period of more than six years, not one was found infected by bilharzia, and, further, though *S. mansoni* was brought into Goa probably as long ago as 1912, and certainly as long ago as 1914, the parasite has attacked none of the native inhabitants.
2. No indigenous mollusca have been found infected.
3. Of 108 soldiers of the present African troops 59 were found infected by *S. mansoni* and 1 by *S. haematobium.*
4. It has not been found possible to infect experimentally any indigenous fresh-water mollusca.

It would appear therefore that although *S. mansoni* has been imported by troops from Africa, it cannot become endemic in Portuguese India.

F. S. Arnold.

LOPES (J. Bastos). **Um caso de bilharsiose em uma senhora que nunca sahiu do paiz.** [A Case of Bilharziasis in a Woman who had never been out of the Country (Portugal).]—*Med. Contemporanea.* 1921. Nov. 13. Vol. 39. No. 46. pp. 361-363.

An account of a woman of Algarve, Portugal, 46 years of age, who had never been out of the country, infected with urinary schistosomiasis. Treatment with tartar emetic intravenously gave good results. Twelve injections were given, amounting in all to 1·02 gm. of the drug, the course being spread over two months. The explanation put forward as to the origin of the disease is that the patient was accustomed to stand for hours at a time washing clothes in a tank in which were also washed the clothes from the Tavira Hospital nearby.

H. Harold Scott.

BETTENCOURT (A.), BORGES (I.) & DE SEABRA (A.). **La température de l'eau et la bilharziose à Tavira (Portugal).**—*C.R. Soc. Biol.* 1922. Feb. 11. Vol. 86. No. 6. pp. 330-331.

All verified cases of bilharziasis (47) were professional laundresses, or women and young girls who washed clothes frequently in the basin at Atalaia, in Tavira, with a single exception of a boy, aged 13 years, who bathed in this water. The women are in the habit of urinating into this water. They also occasionally use the washing place at Pelames ; but in the urine of women who habitually used this place no bilharzia ova were found. The water in both cases comes from sources at a temperature of 25·5° C., but the water in the brook at Pelames is cold and no *Planorbis corneus* was found, whereas the water used for washing at Atalaia has not lost its heat. The authors suggest that there is an intimate connexion between the development of *Schistosoma haematobium* and the temperature of the water ; and they cite similar observations made by CONNOR, in Tunis, in 1910.

R. T. L.

Bettencourt (A.) Borges (I.). **Le** *Planorbis metidjensis*, **hôte intermédiaire du** *Schistosoma haematobium* **au Portugal. Confirmation expérimentale.**—*C.R. Soc. Biol.* 1922. Nov. 11. Vol. 87. No. 33. pp. 1039–1040; also *Arquivos do Inst. Bact. Camara Pestana.* 1922. Vol. 5. No. 2. pp. 133–135. With 2 text figs.

Mice and guinea-pigs were exposed to infection by cercariae from *Planorbis corneus* var. *metidjensis* collected at Tavira, in Portugal. Three of the mice died about three months after infection, and schistosome adults were found in the portal vein and its branches, whilst sections of the livers showed numerous eggs and some adults. The worms showed typical characters and measurements of *S. haematobium*. Two microphotographs of the ovulating female are given.

R. T. L.

Bettencourt (A.) & da Silva (E. Pereira). **Le système excréteur de la cercaire du** *Schistosomum haematobium*.—*C.R. Soc. Biol.* 1922. May 13. Vol. 86. No. 17. pp. 1050–1052. With 1 text fig.

The number and nature of the mucus glands and the arrangement of the excretory system form the essential characters upon which the cercariae of the various human schistosomes are classed. The authors figure and describe in detail the cercaria of *S. haematobium* as found in *Planorbis metidjensis* in Portugal. Save in slight differences the excretory apparatus corresponds with that of the cercaria of *S. japonicum*. Three pairs of glands with large acidophil granules in the cytoplasm occupy nearly the whole of the posterior portion of the body.

R. T. L.

Lopes (Bastos). **Um caso autochtono de bilharsiose em Portugal.** [An Indigenous Case of Infection with *Schistosoma haematobium* in Portugal.]—*Med. Contemporanea.* 1921. Nov. 20. Vol. 39. No. 47. p. 376.

States that the first case of this condition in Portugal, the discovery of which had been attributed to Dr. Borges, had previously been seen and diagnosed by Lopes, and that the specimen containing the ova had been sent by the latter to Dr. Borges, who had in turn asked the consent of Dr. Lopes before reporting the case. The writer wishes to put on record his claim to priority.

H. Harold Scott.

i. Broden (A.). **Un cas de bilharziose rectale chez l'Européen au Congo Belge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 171–173.

ii.——. **Un cas de bilharziose rectale chez un Européen au Congo Belge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Vol. 2. No. 1. pp. 131–132.

i. The patient was a colonial agent resident in the Belgian Congo since 1906. One month after returning from leave in 1917 he had an attack diagnosed without bacteriological examination as dysentery which was treated with emetine; amoebae were afterwards found in the stool. The attack was slight and there was a return in 1920, and the same treatment eliminated the morbid symptoms. With these exceptions the man had good health throughout his term of service. Later in the year he was examined and numerous ova of *S. mansoni* were found, but except for the loss of about 2½ stone, he was in good condition. Treatment with tartar emetic was carried out successfully by intravenous injection of 53 cgm. given in eight graded doses.

ii. This is the second case of rectal bilharziasis in an European in the Belgian Congo. A member of the colonial troops, he was stationed in E. Africa and Uele for two periods of 3½ years and a final period of 4½ years. He was rarely ill. In the first period he suffered for a few days from fairly severe enteritis, and at the end of the second term he was sent home on leave owing to "diarrhée sanguinolente." During the last term he was not indisposed. He was examined for other reasons, and it was found that his stools contained strongyloides larvae and numerous eggs of *Schistosoma mansoni*; so that the tolerance of the intestine extended over a period of at least five years. The author ends by stressing the insufficiency of a purely clinical examination of colonials.

R. T. L.

HOFFMANN (W. H.). **Zur Verbreitung der Bilharziosis in Westindien.** [The Distribution of Bilharziasis in the West Indies.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 9. pp. 270–271.

The author, after making repeated examinations, is unable to confirm the statement previously made that Cuba is one of the chief endemic centres of *S. mansoni*. Only two positive findings were obtained and both patients had come from Porto Rico where the infection is common. The absence of the disease is explained by the fact that *Planorbis guadelupensis* has not been shown to exist in Cuba.

R. T. L.

FÜLLEBORN (F.). **Über den Nachweis der** *Schistosomum mansoni*-**Eier im Stuhl.** [Detection of Ova of *Schistosoma mansoni* in Faeces.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 11. pp. 334–340.

The method described takes advantage of the effects of moisture, temperature and light on the escape of miracidia from the ova. The detail of the procedure is as follows:—A portion of the faeces the size of a hazel nut is carefully rubbed down by gradual addition of 2–3 per cent. NaCl solution (several smaller pieces taken from different parts of the stool are better). The containing glass is then filled up with the salt solution and the mixture allowed to settle for five minutes; the ova sink. The supernatant fluid is poured off, fresh solution added, and sedimentation again allowed to take place. This is repeated two or three times. The finer particles are thus removed and the deposit contains the ova and the larger fragments. Some of the deposit is taken "with not too fine a pipette" and examined in a fairly thick layer without a coverglass.

If, after the last decanting, one adds warm water to the washed mass (the temperature in the glass should be about 40° C.; this is obtained by adding the water at 45° or 50° C. to the sediment) and places it in a bright light—sunlight or that of an electric lamp—miracidia are seen to escape in large numbers and can be seen easily with a lens; a microscope is not necessary as a rule, unless one wishes to look for dead ova, as when controlling the effects of treatment. Finding of the miracidia is facilitated by placing a slip of black paper round the glass to cut out the light from the side and then viewing the contents by a strong illumination from above.

R. T. L.

KHALIL (M.). **The Morphology of the Cercaria of** *Schistosomum mansoni* **from** *Planorbis boissyi* **of Egypt.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Apr. Vol. 15. No. 6. pp. 27–34. With 2 text figs.

The author describes in detail the finer structures of the cercaria of *Schistosoma mansoni* and illustrates his paper with two lucid figures. [It is unfortunate that the second figure showing the number and arrangement of the periacetebular glands is wrongly stated in the legend to be *S. haematobium.*] The number of flame cells in this cercaria is constantly three pairs in the body and one pair in the tail. At the beginning and at the end of the " main excretory ducts " are cilia which in all probability were mistaken by previous workers for flame cells. Of the periacetebular glands Khalil finds five pairs only, and these have a similar number of ducts and terminal spines. They are arranged in two groups, two anterior granular large cells on either side and a posterior group of three pairs of smaller cells with finer granules.

R. T. L.

KAZAMA (Yoshiaki). [**An Experimental Study on the Per Os Infection by** *Schistosoma japonica.*]—*Hokuetsu Igakkwai Zasshi* (*Hokuetsu Med. Jl.*). 1922. Apr. Vol. 37. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol 2. No. 9. pp. 264-265.]

Negative results always followed repeated feeding of *S. japonicum* cercariae to a rabbit. The author concludes that these cercariae cannot penetrate the mucous membrane.

R. T. L.

CORT (William W.). **The Development of the Japanese Blood Fluke** *Schistosoma japonicum* **Katsurada, in its Final Host.**—*Amer. Jl. Hyg.* Baltimore. 1921. Jan. Vol. 1. No. 1. pp. 1–38. With 3 text figs. and 4 plates.

In the cercaria of *S. japonicum* adaptive characters for locomotion and penetration have kept in a very primitive condition the primordial characters of the adult. The theory that sex in the schistosomes is differentiated in the miracidium and that the resulting cercariae are all of the same sex is supported. The cercariae enter at any point on the wet skin, but most frequently through the hair follicles. Most of the cercariae after entering the skin invade the small bloodvessels and lymph spaces. By the 12th day the majority of young schistosomes have reached the bloodvessels of the liver where alone conditions are favourable to growth. At the earliest stage in the liver the sexes cannot be distinguished, but when between 0·3 mm. and 0·4 mm. in length the males show distinctly larger suckers and broader bodies than the females. Differentiation of the reproductive organs comes later, in the males over 2 mm. and in the females of 1·5 mm.

The paper gives a detailed account of the morphology of the various stages of growth and these are carefully illustrated.

R. T. L.

SUYEMORI (S.). [**Development in the Final Host of the Formosan** *Schistosoma japonicum*.]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*. 1922. Jan. No. 220. pp. 1–3. In Japanese, pp. 1–24. With 3 figs.

Using cercariae obtained from *Blanfordia formosana* procured from a district in Formosa infested with *S. japonicum*, rabbits were infected through the skin. The morphological changes during the subsequent development were studied at various later periods: (*a*) when both sexes were present in the same host; (*b*) when only one sex was present.

The very young female is well developed anteriorly, but after embracement by the male the whole of the anterior part gradually atrophies and the suckers become smaller. The posterior part meantime develops rapidly and in the full-sized female this is long and big. In the very young male the anterior part is similarly well developed and the oral sucker is at first larger than the ventral. Where only one sex results the worms are poorly developed, especially in the case of the female worms in which the posterior end remains primitive, only increasing a little in length. In some of the worms a well pronounced furrow runs from head to tail along the mid-ventral surface. Apparently the female requires some stimulus from the male, transmitted by embracement, for its full development.

R. T. L.

CHU (H. P.). **Schistosoma Infection of a Dog.**—*Nat. Med. Jl. China* 1922. June. Vol. 8. No. 2. pp. 116–119.

From a detailed study of the pathological findings in a case of *S. japonicum* in a dog in Huchow, China, the author concludes that there must be some sort of toxic material elaborated by the worms which produce chronic, continuous and progressive disturbances. Tubercular-like structures in the liver, spleen and intestines represent the sphere of attraction of lymphocytes and endothelial cells by eggs acting either mechanically or chemically, or together. There were haemorrhages in the liver and intestines, which were probably due to rupture of capillaries resulting from a pressure of eggs in them.

R. T. L.

CHRISTOPHERSON (J. B.). **The Intravenous Injection of Antimony Tartrate in Japanese Bilharzia Disease.**—*Brit. Med. Jl.* 1921. Oct. 8. p. 551.

A rectal case of infection with *S. japonicum*, in which there was a positive Fairley reaction, was treated with tartar emetic, and after 21 gr. in all were administered there was a disappearance of the eggs and a negative complement deviation reaction.

R. T. L.

CAWSTON (F. G.). **Emetine in Japanese Bilharzia Disease.**—*Brit. Med. Jl.* 1921. Dec. 17. p. 1031.

A Japanese medical officer on a ship entering Durban informed the author that three cases of *S. japonicum* infection had been successfully treated with emetine injections, given in doses of from a half to one and a half grains on alternate days over a period of one month. The author adds that severe cardiac depression is likely to occur during the second or third week of treatment with this drug. R. T. L.

MIYAGAWA (Yoneji). **Ueber die Veränderungen der Eier des** *Schistosomum japonicum* **unter den Einwirkungen verschiedner physikalischen und chemischen Agenzien und ueber einige prophylaktische Massregeln der Schistosomiasis.** [Changes in Eggs of *Schistosoma japonicum* under the Influence of Physical and Chemical Agents. Prophylactic Measures.]—*Mitt. a. d. Med. Fak. d. Kais. Univ. Tokyo.* 1916. Vol. 15. No. 3. pp. 453–474. With 1 plate. [Received July 26, 1921.]

The author gives a full description of the effects of certain physical and chemical agents on the eggs of *Schistosoma japonicum*. He shows that Schistosoma eggs and their intermediate host can be destroyed by putting crude calcium cyanamide, humus-carbolineum and lime in a certain concentration in infected fields and in infected streams.

R. T. L.

CRAMER (Alec). **Trois cas simultanés d'anémie pernicieuse bothriocéphalique chez trois soeurs.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Nov. 16. Year 38. 3rd Ser. No. 31. pp. 1475–1477.

The three sisters were mentally deficient and had lived voluntarily for two years almost completely shut up in one room, living on preserved food under revolting sanitary conditions. In 1917 they had eaten undercooked pike for several meals and a few weeks later portions of tapeworm were passed. After twelve months, palor of the teguments was noticed, and at the time of admission in December, 1921, all three were delirious, extremely wasted, with oedematous ankles, and the skin and mucous membranes colourless. The subsequent history is as follows :—

——, aged 35. Died three days after admission. Examination of blood during death agony : haemoglobin 11 per cent., erythrocytes 1,700,000, colour index 0·32, leucocytes 3,600, neutrophiles 67 per cent., lymphocytes 32 per cent., large mononuclears 1 per cent., numerous nucleated reds, anisocytosis and poikilocytosis. Post-mortem : severe general anaemia, heart slightly hypertrophied with very marked fatty degeneration. Ecchymoses under the pericardium and the endocardium and in the oesophagus, deposition of haemosiderin in the liver and kidneys. Marrow the whole length of the femur was red. Three Bothriocephalus, several metres long, were found in the small intestine.

——, aged 38. Died six days after admission. Haemoglobin 25 per cent., erythrocytes 540,000, colour index 2·3, leucocytes 3,100. Administration of male fern caused expulsion of two Bothriocephalus, 2 m. and 2·5 m. long. Mesosystolic murmurs were heard. Spleen was percussible for three fingers' breadth. Post-mortem : severe anaemia of all organs ; cloudy swelling of the kidneys and enlargement of the tracheo-bronchial lymph glands.

——, aged 36. On admission, mesocardiac murmurs, spleen percussible for four fingers' breadth ; liver was not enlarged, but efficiency value was low. Blood : haemoglobin 25 per cent., erythrocytes 806,000, colour index 1·5, leucocytes 7,750, a few rare myelocytes, anisocytosis, poikilocytosis and polychromatophilia. A vermifuge did not expel any helminthes, but, on the contrary, the stools contained numbers of Bothriocephalus worms [*sic*]. There were multiple recent haemorrhages in the fundus oculi. Her state rapidly improved, and a month later the haemoglobin was 75 per cent., erythrocytes 3,968,000, colour index 0·96,

leucocytes 9,300. On discharge, 67 days after admission, she felt well; the integument and mucosae were the normal colour.

The author considers that these cases, in the light of the literature, support the view that bothriocephalous anaemia depends on individual idiosyncrasy and lowered resistance of the host, rather than on the condition of the worms or their number.

R. T. L.

CRAMER (Alec). **A propos de quatre cas d'anémie pernicieuse botriocéphalique.**—*Rev. Méd. de la Suisse Romande.* 1922. Nov. Vol. 42. No. 11. pp. 718–727.

The author reaffirms the theory that bothriocephalous anaemia is dependent upon some predisposing factor; in this case the environment and mode of life were calculated to lower the resistance to any strain placed on the organism.

New case, female, aged 39. Throughout her life she had been underfed and overworked. In June, 1921, she began to waste, and also to pass segments of tapeworm, in all estimated at 7 metres. In August she had anorexia, intestinal pains and muscular weakness. She was admitted on November 9. Her colouring was pale and she was weak and nervous. Her temperature was 38·8° C. and ranged from 37·2° to 39·5° until death. The abdomen was very tender but little swollen. The liver was diminished, but the spleen enlarged. There was a slight cardiac murmur, but no jugular murmur. The macular region of the right eye showed a considerable haemorrhage. The stools did not contain Bothriocephalus eggs, but after 4 gm. of male fern extract 1·5 m. of *D. latus* were passed.

Blood.—On admission: red cells 1,240,000, haemoglobin 35 per cent., colour index 1·4, white cells 2,720, polynuclears 52 per cent., lymphocytes 33 per cent., large mononuclears 14 per cent., transitionals 1 per cent.; no eosinophiles. There was anisocytosis and slight poikilocytosis. Five days after the vermifuge: red cells 1,110,000, haemoglobin 30 per cent., white cells 3,500. Three weeks after the vermifuge: red cells 1,286,000, haemoglobin 45 per cent., colour index 1·8, white cells 12,400.

She died on January 21. The autopsy showed, besides a marked anaemia, catarrh of the stomach and intestine, oedema of the meninges, recent mitral endocarditis and fatty degeneration of the myocardium, ulceration of the vagina and deposition of iron in the liver.

R. T. L.

YOSHIDA (Shiro). [**On the Morphology of the Adult Worm of** *Sparganum mansoni* **found in the Frog and other Animals.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1922. Mar. & Apr. Nos. 2271 & 2272. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2. No. 10. p. 296.]

The larval Sparganum found in the human body and in frogs develops in cats and dogs into adults identical in morphology. Dogs and cats, as well as chickens and ducks, have been found harbouring the same parasites. Infection of man results from drinking water containing infected Cyclops, or from the eating of raw chicken.

R. T. L.

MUTO (Masatomo) & MIHARA (Yoshisuke). **[On the Origin of a Species of Cestode (the Adult Form of *Sparganum mansoni*) that prevails among the Cats in a Village in Okayama Prefecture.]**—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1921. Mar. No. 2217. [Summarized in *Japan Med. World.* Tokyo. 1921. July 15. Vol. 1. No. 3. p. 28.]

A large percentage of the cats in a village in the Okayama Prefecture harbour an intestinal tapeworm identified as *Sparganum mansoni*. The frogs in the same village are heavily infested with this parasite. When specimens were fed to a dog, eggs were found within 10–11 days in the faeces. It is considered that the eating of frogs thus infested results in infection with *S. mansoni*. R. T. L.

FÜLLEBORN (F.). **Über** *Hymenolepis diminuta* **(Rud.) 1819.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 7. pp. 193–202. With 1 plate and 6 text figs.

The case occurred in a boy, four years of age, of German birth, in German East Africa [and is wrongly described as the seventeenth recorded instance of infestation with *Hymenolepis diminuta* (see RILEY, this *Bulletin*)]. The average size of the ova was 63·8 by 60·3 microns, the extremes being 77 by 69 and 59 by 49, and that of the oncosphere in its envelope 32·8 by 30·6 microns.

A description is given of the arrangement of the hooklets prior to the escape of the oncosphere. Attempts were made to infect white mice, but the eggs passed unchanged through the intestine; the same occurred with the meal-worm (the larva of *Tenebrio molitor*), though JOYEAUX claims to have infected the imago. R. T. L.

RILEY (William A.) & SHANNON (W. R.). **The Rat Tapeworm,** *Hymenolepis diminuta*, **in Man.**—*Jl. Parasit.* 1922. Mar. Vol. 8. No. 3. pp.109–117.

A review of the instances of human infestation with *H. diminuta* shows that a total of 61 cases are now on record. Of these one has been contributed by the authors in the present paper, and three are annotated in an addendum. The geographical distribution of the known infections is as follows: Brazil, 19; United States, 16; India, 8; Italy, 7; Nicaragua, 3; and one each for Argentine, Belgium, Cuba, East Africa, Grenada, Martinique, Philippines, Japan. A useful bibliography is given, which includes several references overlooked by RANSOM (1904). R. T. L.

ALESSANDRI (Carlo). **Contributo alla diagnosi biologica della** *Taenia saginata* **(Nota preventiva).**—*Riv. Crit. di Clin. Med.* 1922. Oct. 5. Vol. 23. No. 28. pp. 325–329.

An intracutaneous and a subcutaneous reaction is given for the detection of patients harbouring this tapeworm. Three forms of antigen were prepared. The parasite, after being washed in normal saline, was dried in a desiccator for three days and then triturated in a mortar. The first antigen was a saline extract; the second the alcohol insoluble portion; the third, the alcohol soluble fraction evaporated at 56° C. 0·5 cc. of a 1 in 10 dilution of an antigen is injected into one shoulder and an equal quantity of saline into the other.

In a positive case, in from 4 to 24 hours, there was a red, raised, infiltrated and painful zone, 3–4 cm. in diameter, around the site of injections of the antigen, with swelling of the axillary glands and a slight elevation of temperature to 37·4° or 37·5° C. (99·3°–99·5° F.). The first antigen gave the best results, the second one less marked, the third none.

One patient infected with echinococcus and another with ankylostome yielded negative results with all three antigens, and patients with Taenia proved negative with echinococcus and ankylostome antigens.

H. Harold Scott.

Isobé (M.). [**On the Resistance of the Egg of** *Taenia saginata* (?).]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*).—1922. May. No. 222. English Summary, pp. 2–3. [In Japanese, pp. 29–74.]

Embryos were still alive in eggs treated in the following ways :—

(*a*) Dry state at room temperature for thirty days ;

(*b*) 5 per cent. carbolic acid for one week ;

(*c*) 10 per cent. formalin for three weeks.

The author states that he has found a method, which is not described in the English summary, of liberating the embryos from the eggs.

R. T. L.

Saeki (Yoshihisa). [**A Study on the Resistance of the Egg of** *Taenia nana*.]—*Jika Zasshi* (*Jl. Japan Soc. of Pediatrics*). 1921. May. No. 252. [Summarized in *Japan Med. World*. Tokyo. 1921. Oct. 15. Vol. 1. No. 6. pp. 16–17.]

Treating batches of eggs it was found that some survived :—

(*a*) HCl	in 5 per cent. sol. for 12 hours ; 10 per cent. sol. for 6 hours.
Acetic Acid	in 5 per cent. sol. for 12 hours ; 10 per cent sol. for 6 hours (few for 12 hours).
Nitric Acid	in 5 per cent. sol. for 12 hours ; 10 per cent. sol. for 6 hours.
Sulphuric Acid	in 10 per cent. sol. for 6 hours.
Boric Acid	in 3 per cent. sol. for 24 hours.
Phenol	in 5 per cent. sol. for 6 hours (few for 12 hours).
Cresol Soap	in 5 per cent. sol. for 12 hours ; 10 per cent. sol. for 6 hours.
Caustic Soda	in 5 per cent. sol. for 12 hours ; 10 per cent. sol. for 6 hours.
(*b*) Alcohol	in 80 per cent. sol. for 24 hours.
Formalin	in 10 per cent. sol. for 12 hours.
(*c*) Sodium Chloride	in 20 per cent. sol. for one week.
Soya Sauce (Sodium Chloride)	in 15 per cent. sol. for 5 days.
Saturated Chalk	for 24 hours.
Calcium Chloride	in 5 per cent. sol. for 12 hours.
Calcium Permanganate	in 0·5 per cent. sol. for 12 hours.
Sublimate	in 0·1 per cent. sol. for 1 hour (many survived).
(*d*) Water :—3·0 to 3·0° C.	35 days (all died after 40 days).
summer heat	died very soon (water stagnates).
40° C.	half an hour.
50–55° C.	3 minutes.
60–65° C.	1 minute (all died after 3 minutes).

R. T. L.

ISAACS (Raphael). **An Injection Method for Aiding in the Identification of Tapeworm Species.**—*Jl. Lab. & Clin. Med.* 1922. Aug. Vol. 7. No. 11. pp. 691–692. With 2 text figs.

Pretty and useful microscopical preparations can be made by injecting with India ink through a hypodermic syringe fitted with a fine needle. The injection enables one to differentiate readily *T. saginata* and *T. solium.* By fixing in 10 per cent. formaldehyde, then dehydrating, clearing in xylol and mounting in canada balsam, permanent mounts may be made.

R. T. L.

i. DÉVÉ (F.). **L'échinococcose encéphalique expérimentale envisagée comme type de tumeur intra-cranienne expérimentale.**—*C.R. Soc. Biol.* 1921. Apr. 23. Vol. 84. No. 14. pp. 711–713.

ii. ——. **Echinococcose cérébrale intra-ventriculaire expérimentale.** *Ibid.* 1922. May 27. Vol. 86. No. 19. pp. 1120–1121.

iii. ——. **Echinococcose cérébelleuse expérimentale.**—*Ibid.* June 10. Vol. 87. No. 21. pp. 54–56.

i. By two experimental inoculations of hydatid fluid in rabbits, the author demonstrated the value of this as a procedure for the experimental study of cerebral tumours, the symptoms of cerebral hypertension, and other problems of the pathology of the nervous system.

ii. The author had previously stated (*C.R. Soc. Biol.*, April 23, 1921, see above) that direct inoculation of hydatid sand into the cerebral tissue caused a localized infection only, and was valuable for the study of sterile tumours. He now modifies this, having found that multiple infection of the brain may result by this method, cysts being found also in the cavities of the brain, in the cerebral fissures and in the great transverse fissure. The spread of infection was attributed both to the passive migration of scolices in the cerebrospinal fluid in the sub-arachnoid space and also to their active migration. A further note on this latter method is promised.

iii. An account is given of the inoculation, under aseptic conditions, of hydatid sand into the cerebellum of two rabbits. In both cases, two days after inoculation, unstable equilibrium, torpor, and loss of appetite came on, but disappeared in a few days, and the animals remained normal to within a few days of their death, after 136 and 164 days respectively. The symptoms then returned, rotation of the head to the left side, torpor, loss of equilibrium, refusal of food and rapid loss of weight were amongst the more important. Rabbit A, killed after 136 days, showed a cyst in the hypophysical region adherent to the sella turcica, as well as complete destruction of the anterior part of the left hemisphere and the vermis of the cerebellum. Rabbit B had the whole of the anterior part of the cerebellum destroyed by cysts, but none were found in any other part of the brain or cord.

R. T. L.

DÉVÉ (F.) & BILLIARD (A.). **Sable hydatique et radiothérapie.**—*C.R. Soc. Biol.* 1922. June 17. Vol. 87. No. 22. pp. 127–128.

Hydatid sand was exposed to X-rays of different strengths for varying periods, and then inoculated subcutaneously into rabbits. Their viability appeared to be unaltered. The authors propose carrying out experiments to determine the resistance of germinative membrane of the cyst to X-rays.

R. T. L.

DÉVÉ (F). & PAYENNEVILLE (J.). **Echinococcose et arsénobenzènes.**—*C.R. Soc. Biol.* 1922. June 17. Vol. 87. No. 22. pp, 129–130.

A rabbit was inoculated subcutaneously with hydatid sand and then given enormous and repeated doses of novarsenobenzol (neosalvarsan, " Erhlich 914 "). On removing a portion of the tumour some months later active multiplication of vesicles was found to be going on, surrounded by a caseous encysted substance in the subcutaneous tissue. The authors are entirely at variance, by reason of this result, with ROUX and KOLBÉ, who claimed that a massive necrosis of hepatic hydatid cysts had been obtained with a single dose in two human cases. They even suggest that the arsenic may have stimulated multiplication.

R. T. L.

BREMER (K.). **Hydatid Disease.**—*S. African Med. Rec.* 1921. May 14. Vol. 19. No. 9. pp. 165–167.

Clinical notes are given of eleven cases of hydatid cyst which presented unusual features and came under the author's observation during eight years' practice in the Karroo districts of Cradock and Graaff-Reinet, South Africa.

No. 1 was an European boy, 12 years old, admitted with a temperature of 102°, looking ill and complaining of cough. The liver extended 1½ in. below the costal margin, but no definite tumour could be felt. In hospital he commenced to cough up frothy fluid and was in great pain. Under an anaesthetic a hydatid cyst was incised and the septic endocyst, vile-smelling and green-coloured, was removed after evacuation of the fluid contents. No. 2, a young woman aged 24, complained of pain after food and occasional vomiting. She was emaciated, a semi-invalid, and supposed to have a gastric ulcer. A distinct rounded mass could be felt on the under surface of the liver, which proved at subsequent operation to be a hydatid. No. 3 had multiple tumours of the liver, causing distress in breathing. Much bile-stained fluid poured from the operation wound for a week after the hydatid cyst was drained. No. 4, aged 28, was taken ill suddenly with pain in chest and difficult breathing. The left side was dull to percussion and breath sounds absent. His temperature was 103°. Clear transparent fluid was drawn off, but the diagnosis of pleural effusion following pleurisy was incorrect, for the man died later of hydatid of the lung.

R. T. L.

BERGÉ (André), BÉNARD (Réné), GUTTMANN (R. A.) & ROBERTI (J.). **Crise hémoclasique hydatique développée à la suite d'une ponction évacuatrice d'un kyste du foie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1921. Feb. 25. 3 sér. 37e. Année. Vol. 45. No. 6. pp. 184–191. With 1 chart in text.

The authors maintain that superficial hydatid cysts can be treated by puncturing with less danger than by excision. In this case puncture was followed by slight toxic effects, rise of temperature and rapid heart beat; but in two days equilibrium was re-established.

R. T. L.

FAIRLEY (N. Hamilton). **A Note on the Failure of Tartar Emetic in the Treatment of Two Cases of Hydatid Disease.**—*Med. Jl. Australia.* 1922. Jan. 28. 9th Year. Vol. 1. No. 4. pp. 94–96.

Two cases of suspected hydatid cyst, both of whom had previously had hydatid cysts removed and gave strongly positive Casoni's reaction and complement fixation with hydatid antigen, were subjected to a full course of intravenous injections of tartar emetic. The reaction remained unchanged in both cases. One case was then operated on and a living cyst containing three daughter cysts removed, and the reaction of the serum disappeared in nine months, though Casoni's reaction remained positive. No trace of antimony was found in the endocyst or daughter cysts. The other case was not operated on, and still gave a positive complement fixation reaction after fifteen months.

R. T. L.

LACHAUME & TOURNIER. **Sur un cas de kyste hydatique intra et extra-cranien constaté, après mort subite, chez un tirailleur Sénégalais.**—*Ann. de Méd. et Pharm. Colon.* Paris. 1920. (Numéro exceptionnel.) pp. 77–79.

The paper records the occurrence in a Senegalese soldier of an intracranial hydatid cyst, about the size of a large apple. This had perforated the skull in six places and penetrated outwards into and below the temporal muscle.

R. T. L.

DÉVÉ (F.). **Il n'existe pas de kystes hydatiques primitifs de la vésicule biliaire.**—*C.R. Soc. Biol.* 1921. Oct. 15. Vol. 85. No. 28. pp. 632–634.

After carefully examining the evidence in favour of the existence of hydatid cysts in the gall bladder the author concludes that these cysts never occur primarily in this organ. In some of the cases observed at operation the cyst was found to open into the gall bladder, in others there was probably a secondary invasion of the gall bladder by cysts which reached it along one of the large bile ducts. Therapeutically these observations are important, for if the opposite view is held an operator might restrict himself simply to performing cholecystectomy, and in so doing might overlook hydatid cysts deeply buried in the liver tissue.

R. T. L.

DÉVÉ (F.). **Echinococcose cérébrale intraventriculaire.**—*C.R. Soc. Biol.* 1922. May 20. Vol. 86. No. 18. pp. 1062–1064.

A boy, aged eight, showed typical signs of cerebral tumour. A lumbar puncture revealed great hypertension of the cerebro-spinal fluid, but did not relieve the symptoms, and he died four days later. The disease began to show 7–8 months previously. The autopsy showed a large number of cysts in the cerebral vesicle but no mother cyst. A solitary cyst undergoing caseous involution was found on the under surface of the liver.

R. T. L.

NEVEU-LEMAIRE (M.). **L'infestation par la voie cutanée de divers Nématodes parasites de l'homme et des animaux.**—*Bull. Acad. Méd.* 1922. June 30. 3rd Ser. Vol. 87. No. 25. pp. 697–699.

An historical summary on this subject is followed by a suggestion that dermatitis of helminthic origin in man may be occasioned by nematode larvae of worms which attain the adult stage in certain other animals, but perish a few days after entering through the skin of the human host. Conversely, larvae of nematodes parasitic in man will pierce the skin of animals, but likewise perish before reaching the adult stage in these experimental abnormal hosts.

R. T. L.

ALBISTON (Harold E.). **Nematodes in Pigs.** [Correspondence.]—*Med. Jl. Australia.* 1922. Aug. 5. 9th Year. Vol. 2. No. 6. p. 173.

The nematodes from semi-domesticated pigs in Queensland, reported by LEGG and RHEUBEN (1921), and identified by Dr. SWEET as *Ancylostoma duodenale* [this *Bulletin,* Vol. 19, p. 258], have been examined by Dr. DARLING, and of the five specimens, three have proved to be *Necator americanus* and two *Ancylostoma duodenale.* R. T. L.

i. WATANABE (Koh). [**On Two Human Cases of Rhabditis Infection.**]—*Nihon Shyokakibyo Gakkwai Zasshi* (*Japan Jl. of Gastro-Enterology*). 1922. Mar. Vol. 21. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 261]

ii. TORII (Kuniyasu) & WATANABE (Hiroshi). [**On Rhabditis occurring in the Human Feces.**]—*Iji Shimbun.* (*Med. News*). 1921. Feb. No. 1613. [Summarized in *Japan Med. World.* Tokyo. 1921. June 20. Vol. 1. No. 2. p. 23.]

i. The English summary of this paper states that the author identified the parasite found in one of his two cases as *Rhabditis faecalis* n. sp. [No description of the species is given.]

ii. Rhabditis is of no clinical importance, but may cause confusion in diagnosis, since the eggs are often mistaken for those of *Strongyloides intestinalis.* All the authors' cases coincided with hookworm infection.

R. T. L.

ROUSSEAU (L.). **Notes relatives à** *Strongyloides intestinalis.* **Caractères et Biologie de ses larves strongyloides.**—*Bull. Soc. Path. Exot.* 1921. Apr. 13. Vol. 14. No. 4. pp. 214–219.

The author describes the best method for observing and keeping the larvae of ankylostomes and *Strongyloides intestinalis* and notes their differences.

In one case in cultures of anguillulines he saw rhabditis forms evolve into strongyloid forms after 35, 33 and even 30 hours, without passing through the intermediate sexual stage. Strongyloid larvae produced after the sexual stage never appear at the earliest until the fourth day, whereas ankylostome larvae never reach the strongyloid stage until the fifth day. Development may be suppressed by certain conditions, *i.e.* in faecal material which is too strongly acid embryos will die before escaping from the eggs. A certain degree of acidity, whilst arresting the development of ankylostome eggs, allows the anguilluline larva to live and develop. Very slight acidity seems to be favourable to strongyloid anguillulines, causing them to be developed direct from the rhabditis forms. The author's experiments cause him to hold the view that there are two normal methods of development: (1) direct from rhabditis to strongyloid forms; (2) indirect, in which a sexual stage intervenes; the latter being the slightly more frequent of the two. He concludes that the direct method is normal and intrinsic, and in no way due to the composition of the surrounding medium.

R. T. L.

FORNARA (Piero). **Un caso di ematuria da strongiloide intestinale.** [A Case of Haematuria due to *Strongyloides intestinalis.*]—*Policlinico.* Sez. Prat. 1923. Jan. 15. Vol. 30. No. 3. pp. 75–80.

A woman, a native of Novara, 49 years of age, in excellent health, was suddenly seized with left renal colic. The urine subsequently passed was brownish-red, albuminous (1·5 per cent. by Esbach's instrument), with a considerable quantity of blood and numerous filariform larvae of *Strongyloides intestinalis*. Rhabditiform larvae were found in the stools 19 days later ; they had been looked for during the interval, but without success.

The author thinks that the larvae passed via the lungs to the left side of the heart, thence to the systemic vessels and to the kidney.

H. Harold Scott.

DUNDERDALE (G.). **Notes on the Incidence of Filarial Infection in the Neighbourhood of Lamu, British East Africa.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1921. Nov. 17 and Dec. 15. Vol. 15. Nos. 5 and 6. pp 190–197. With 1 map.

Statistics for 1911–12 showed a very marked difference—14 out of 28 and 1 out of 23 cases examined—of infection with filaria in Siyu and Faza respectively, villages a few miles apart on Patta Island. The author tried to find a reason for this, but his own results showed in Siyu 36 out of 82, and in Faza 10 out of 27 persons examined harboured filaria. He found no tribal incidence, and suggests that sedentary workers were more prone to infection. [The number examined on all occasions seems to be too small to warrant comparison ; for instance, Lamu, population 7,000, examined 66.] The filaria embryos found were all diagnosed as *F. bancrofti*, and showed almost complete nocturnal periodicity. The mosquitoes found throughout the district are : *Culex fatigans*, *Stegomyia fasciata* and *Pyretophorus costalis*, and at Siyu, *Howardina pembaensis* is very common.

Elephantiasis of the legs and scrotum is common, as is filarial fever, lymphangitis and hydrocele. Lymphangiectasis occurs, but the author has seen no definite case of chyluria. The majority of infected persons appear to show no symptoms for at least a quarter of their life. No European and few Indians have suffered from elephantiasis.

R. T. L.

STEPHENS (J. W. W.). **Some Statistics of Filariasis.**—*Ann. Trop. Med. & Parasit.* 1921. Feb. 8. Vol. 14. No. 3. pp. 341–354.

The basis of this article is the material upon which MANSON-BAHR wrote his monograph on filariasis in Fiji and Ceylon. The conclusions of the author are that while the microfilaria rate in Fiji is higher than in Ceylon, and the rates for enlarged glands, hydrocele and abscess are also higher, yet there is no evident correlation. The elephantiasis rates are the same, although the microfilaria rate in Fiji is more than eight times as great as in Ceylon. Microfilaria is commoner amongst those with, than among those without, signs of filarial disease. Signs of filarial disease are commoner among those infected with than among those without microfilaria. A series of eleven tables accompanies the text.

R. T. L.

ROY (S. K.) & BOSE (S. C.). **Filariasis at Puri.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 281–286. With 1 plate.

Out of 571 unselected persons examined in Puri jail and Sadar hospital during a period of two years, about 27·3 per cent. harboured microfilariae in their blood, and about 28 per cent. exhibited the clinical manifestations of filariasis. Those examined were mostly adult males. Only 22·6 per cent. of cases showing typical lymphangitis and fever show microfilariae. Two cases only of chyluria were seen, and both showed microfilariae in the peripheral blood. Microfilariae occurred in 29 per cent. of healthy men, while in elephantiasis cases they were seen in only 12·9 per cent. Enlargement of the leg constituted 75 per cent. and of the scrotum 10 per cent. of the cases of elephantiasis at Puri. Seventeen cases of filarial abscesses were treated, and 15 of these gave a history of fever and lymphangitis, while six had embryos in the blood.

Ninety per cent. of the mosquitoes in Puri are *Culex fatigans*, and 34 per cent. of the mosquitoes in the town are infected with microfilariae. With the sudden advent of cold weather the embryos in the mosquitoes became sluggish or died. A single infected person entering a ward infected 33·1 per cent. of the mosquitoes there. The authors describe the microfilaria and its development in the mosquito in considerable detail. They find that 18 to 20 days are taken to complete the stages of development.

For treatment, antimony compounds are favoured. Sodium antimony thioglycollate was very efficacious in extirpating the microfilariae. Injections of sodium antimony tartrate 2 to 5 cc. daily diminished considerably the girth of elephantoid limbs. The treatment is especially efficacious in the stage of lymphatic oedema and when fibrosis has just commenced, so that the part still pits on pressure. Improvement has occurred in each of 50 cases treated. Cases of lymphangitis and fever were much benefited.

R. T. L.

DAS (P. N.). **A Preliminary Note on an Investigation into Filariasis.**—*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress Number, 1920). pp. 44–54.

A small number of cases of filariasis were treated by intravenous injection of doses of 2–5 cc. of a 2 per cent. solution of sodium antimony tartrate. Generally it was found that after about 26 injections the filariae disappeared from, or were much diminished in number in, the peripheral blood; in a few cases the initial decrease was followed by a great temporary increase of embryo filariae. Four cases of lymphangitis were treated, acute attacks disappeared and some diminution of the swellings was noticed. Two cases of periodic filarial fever appeared to benefit by this treatment. Three cases of suppurating filarial abscess were examined; no filariae were found, but they were found in a man having scars of old filarial abscesses.

R. T. L.

MAXWELL (J. Preston). **Filariasis in China.**—*Philippine Jl. Sci.* 1921. Sept. Vol. 19. No. 3. pp. 257–327. With 24 plates, 1 map and 4 charts.

Filariasis plays a large part in diminishing the working capacity of a considerable number of manual workers in China. *Filaria bancrofti* is the only species of filaria found. *Culex fatigans* and *C. pipiens* are both of common occurrence. The distribution is somewhat peculiar. The infection does not spread north of the Yangtse Valley. It diminishes in frequency also as one ascends the river. From the mouth of the Yangtse to the Tonquin border, the disease occurs in a coastal belt of some 15 to 25 miles broad, but inland the infection is lost save for small patches on the upper reaches of a river. Kiangsi is entirely free, and save on the coast Fukien is uninfected. From hospital statistics the general population would appear to have a 24·8 per cent. infection rate. There is a somewhat discursive description of the various clinical manifestations of filariasis, in which the author embodies much text-book material, thus overwhelming his many interesting personal observations. Filarial haemoptysis is mentioned, but it is not possible in China to exclude tuberculosis [and, it may be added, probably paragonimiasis]. Lymphatic varix is occasionally met with in the cutaneous form. Deep-seated varices are rarely seen, but varix of the spermatic cord is encountered during operations for hernia. Three varieties—spontaneous, inflammatory and operative—of lymphatic fistula are illustrated by cases. Varicose groin glands should be left alone, as septic lymphangitis may supervene; operation and removal may precipitate an attack of chyluria or of elephantiasis of the leg. One case of varicose axillary glands is mentioned. Lymphscrotum of all varieties occurs in China. Chyluria is by no means common, while chylous dropsy of the peritoneum and chylous diarrhoea are very rare. Elephantiasis is discussed in detail, and the paper concludes with some observations on the effect of filarial infection on the course of other diseases. In pneumonia and in nephritis filarial infection is thought to have an unfavourable influence.

R. T. L.

KAWAKAMI (Zen). **The Report on the Filariasis.**—*Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. pp. 251–254.

There is a rapid increase in the age incidence of infection with *F. bancrofti* between 13 and 17 years, the age at which both sexes start agricultural labour. The first attack of filarial fever is generally between the third and fourth decade, localized erysipeloid areas of skin appear in the attacks, and these very often gradually pass over into elephantiasis. The inflammatory areas in certain sites are more prone to undergo this change. In the lower extremities, elephantoid change always begins on the anterior surface of the leg. The author recommends the study of the distribution of the patients in endemic areas and, supporting the water-borne theory of filariasis, he considers that metamorphoses are undergone in mosquitoes and other insects and that the metamorphosed larvae escape into water and enter through the skin of host under "yet unknown conditions." He cites a case of a child having filarial fever at the age of two months. The mother says that erysipeloid areas on the lower extremities have gradually spread; they are ten years later typically elephantoid.

A preliminary report is given of the pathology of *F. immitis* in the dog. Larvae were found in greatest numbers in the lung, the myocardium, respiratory muscles and liver, and the author considers that they are enticed there by the active and periodical movement of these organs. Escape of larvae from the host is considered the cause of elephantiasis, and of death in dogs having pneumonia and diarrhoea, as larvae were found in the affected areas in great numbers. But larvae were not found on the altered areas of skin or in the sputum or faeces of living dogs. Filarial fever is attributed to the periodical accumulation of larvae in the blood.

R. T. L.

YAMADA (S.). **[Descriptions of Ten New Species of Aëdes found in Japan, with Notes on the Relationship between some of these Mosquitoes and the Larva of** *Filaria bancrofti,* **Cobbold.]**—*Annotationes Zoologicae Japonenses,* Tokyo. 1921. Oct. Vol. 10. No. 3. pp. 45–81. With 4 figs. [Summarized in *Rev. Applied Entom.* 1922. July. Vol. 10. Ser. B. Pt. 7. p. 147.]

Aëdes (*Culicelsa*) *togoi,* Theo., a common mosquito in Japan, proved to be able to serve as an intermediary for *Filaria bancrofti,* but similar experiments with *A. galloisi, A. chemulpoensis* and *A. esoensis* gave negative results.

R. T. L.

SUGANUMA (Seijiro). **Beiträge zur Kenntniss ueber die Periodizitäts- oder Turnusfrage der** *Filaria bancrofti* **(III. Mitteilung).** [Periodicity of *Filaria bancrofti.*]—*Mitt. d. Med. Gesellsch. z. Tokyo.* 1921. July. Vol. 35. No. 7. [In Japanese, pp. 1–61. German summary, pp. 1–8.]

After careful experiments the author concludes that the periodicity of nocturnal microfilariae is due to the following causes :—

1. The most important cause is their strong negative heliotropism.

2. Chemotropism of the microfilaria towards certain conditions of the blood may increase, or, by a partial heliotropic transformation, hinder the periodicity to a certain degree.

3. Meteorological changes may influence the time of the appearance or disappearance of microfilaria in the peripheral blood.

R. T. L.

MENDELSON (Ralph W.). **Elephantiasis of the Labium.** [Correspondence.] —*Brit. Med. Jl.* 1922. May 27. p. 839.

This case from Siam is reported because (*a*) in Siam elephantiasis of the labium is rare, though filariasis, including other elephantoid lesions, are common, and (*b*) microfilariae were found in the peripheral circulation " at all times."

R. T. L.

PLAYFAIR (Kenneth). **A Note on Dormant Filarial Infection.**—*Lancet.* 1922. Sept. 30. p. 709.

The patient in this case served in West Africa in 1917, and about that time had swellings in both wrists, arms, and above the left eye, which were attributed by a medical officer there to Filaria [*F. loa*]. When admitted to hospital in 1922, for shortness of breath following influenza four weeks previously, a blood count was made on account of the obvious anaemia. The red cells were 2,256,000 per cmm., the white cells 4,800, and the differential count gave polymorphonuclears 38 per cent., eosinophiles 45, lymphocytes 10, large mononuclears 6, basophiles 1 per cent. Microfilariae were found in the blood in the morning and in the evening. They were never numerous. No malarial parasites were found. There were no helminth ova in the faeces.

While in hospital on March 11th the patient awoke totally blind except for perception of bright light when flashed on to the retina. Both eyes were equally affected. The pupils reacted normally to light, and examination of the fundi revealed an acute retrobulbar neuritis. The vision began to return after 48 hours, and rapidly improved until it became normal again at the end of two weeks. There was no fever nor any increase in the microfilariae. The author assumes that the microfilariae lay dormant in the lung from 1917, until released into the general circulation by the attack of influenza. [The eosinophilia and transient ocular symptoms suggest rather the migration of an adult worm.]

R. T. L.

MONTPELLIER (J.) & LACROIX (A.). **Evolution de la gale filarienne (Onchocercose dermique).**—*Bruxelles-Médical.* 1921. Mar. 15. 1re année. No. 5. pp. 140–143. With 3 figs.

The study of 150 cases of filarial itch in Colonial troops shows that the disease takes the following course. First an intense itching of the affected area, with no visible macroscopic or microscopic lesions. A section of the skin taken at this time shows a vigorous invasion by microfilariae, while none were present a few days previously. The patient scratches violently, and in some cases produces urticaria, or transient itching papules. In a few days the itching subsides, the skin becomes normal and sections of it show no microfilariae. A few weeks or months later another attack occurs, and successive attacks produce finally permanent skin lesions. This stage is termed "la periode d'état"; there are diffuse lesions of tender roughened thickened skin, in places a dry papular eruption scattered over with papulovesicular pustules. Diagnosis at this stage is easy, and skin sections almost always show larvae, generally in large numbers, but they are not found in the heads of the papules; hence superficial scarification may not show any. This is attributable to their living outside the vessels in the surrounding tissues.

In the early stages diagnosis is not easy, but sections of the skin of patients having an onchocerca tumour should be carefully examined during the itching stage.

The absence of microfilariae in onchocerciasis is rare and is attributed to the presence of a female worm only. The varying degree of the affection is typical of prurigo, and is due to individual variations of susceptibility of the skin. The apparent absence of periodicity may be increased by the presence of several adults, which will necessarily produce an intermittent discharge of embryos. At any given moment a patient having adult *Onchocerca volvulus* may present no symptoms of filarial itch, but it is quite the exception, in the opinion of the authors, for this condition to be permanent.

R. T. L.

HUDELLET (G.). **Extirpation totale du ver de Guinée après diagnostic de position par les rayons X.**—*Bull. Soc. Méd.-Chirurg. Française de l'Ouest-Africain.* 1919. June. Vol. 1. No. 2. pp. 17–19.

X-ray location of young Guinea-worms is unsatisfactory, as their permeability to the rays is similar to that of the surrounding tissues. But the injection of 10 per cent. Collargol into the worm renders it opaque. A rather blunt needle is stuck into the worm and secured to it by two or three turns of wire, 2 cc. of the solution are injected, and the needle is withdrawn, leaving the wire in place to indicate the site of the injection. An incision of 2–3 cm. is made at the highest point of the middle of the worm, which allows the worm to be seized, and it can be withdrawn, by gentle traction aided by kneading of the tissues, the metallic thread having been previously removed. The worm is easily withdrawn. Occasionally the injection does not penetrate to the end of the worm, and the incision may be consequently too near one end, in which case it is better to make the extraction in two sessions making a new injection and a new incision higher up. A case is reported of the removal of a Guinea-worm 45 cm. long in one operation from the malleolar region; the patient was able to leave the hospital a week later.

R. T. L.

RANSOM (B. H.). **Some Recent Additions to the Knowledge of Ascariasis.**—*Jl. Amer. Med. Assoc.* 1922. Sept. 30. Vol. 79. No. 14. pp. 1094–1097. With 1 text fig.

A review of the present knowledge of ascariasis is followed by a more detailed consideration of the relation of the ascariasis of the pig to the human infection. There probably exists a biological difference, but it is assumed [with probability] that the pig is of etiological significance in the spread of pulmonary ascariasis in man [*cf.* KOINO below].

R. T. L.

KOINO (S.). **Experimental Infections on Human Body with Ascarides.**—*Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. pp. 317–320.

A healthy man, 21 years of age, and having no ascaris eggs in his faeces, was fed with 500 mature ascaris eggs from the pig. The temperature on the 3rd day was 37·4°, and from then until the 9th day 36·4°–37·5° C. On the 9th day there were rigors and the temperature rose to 39·1° and for three days was 37·3°–39·0°; on the 13th day it was 37°, and fell to normal on the 16th day. The cough and the watery mucous sputum increased gradually; no blood and no ascaris larvae were found. The subjective symptoms were pains and a heavy feeling over the front, sides and back of the chest, radiating to the apices. The respiration rose to 27–32, and was normal on the 13th day. The pulse rate increased slightly with the rise of temperature, but was otherwise normal. The second pulmonary arterial sound was slightly increased. On the evening of the 10th day there were dry rales and crepitations and occasional moist rales; these were succeeded by whistling rales; on 13th day they had disappeared from the front and by 15th day they were entirely absent, and by 17th day all symptoms had gone. There were no areas of dullness to percussion, the liver and spleen were not palpated, and there was no albumin in the urine. Fifty days after the test feed an anthelmintic was taken, but no ascarids were expelled.

The author then fed himself with 2,000 mature human ascaris eggs. On the 2nd day there was slight anorexia and headache. On the 3rd day the temperature rose to 37·2° and continued to rise. 6th day there were rigors, severe headache, increased pulse and respiration, and a frequent cough with abundant sputum. On 8th day the temperature was 39·8°, and was 38·7°–40·2° till 13th day after feeding (*i.e.*, to 7th day of the pneumonia), when it began to fall by crisis, and was normal on the 15th day. Respiration increased to 11th day and 12th day, when it was 56–58 and the face was cyanosed; it began to fall with the temperature to 24, and a week later it was normal, but easily increased by slight exercise. The pulse increased with the temperature to 90–120, and was weak and thready at the height of the pneumonia. The cough increased with the rising temperature and was paroxysmal with interludes of 2–5 minutes, and subsided on 17th day. The volume of sputum increased with the rising temperature, and on 13th day was 155 cc. up to 7 p.m., and on the two succeeding days the serious state of the patient precluded its collection. Ascaris larvae, ecdysis was observed in a few, were found in the sputum from the 9th to 16th day. In the sputum of the 11th day 178 larvae were counted; on this and the succeeding day the sputum contained well-mixed blood. [Both these features were absent in the preceding experiment.] There was complete anorexia during the fever. Pain in the chest was almost absent except on the first day of the pneumonia. There were severe muscular pains in the back and lower extremities, and the olfactory nerves were very hypersensitive; only the smell of peppermint was tolerable.

Dry, moist or whistling rales were heard from 10th–15th day, but areas of dullness and tympanic areas were found from 9th day and increased to the crisis; by 15th day the breath sounds were normal. From 11th–13th day the apex beat was accentuated slightly and the second pulmonary arterial sound was "impure." The liver was palpable two fingers' breadth from 10th–16th day, and then gradually diminished in size and was hidden by 21st day. The spleen was not palpable throughout the disease. The urine was decreased, but no albumin was found. The patellar reflex was slightly accentuated. There was congestion of the cornea and throat. Fifty days after the test feed an anthelmintic was taken and 667 worms were expelled; these were all immature and from 3–8 cm. in length.

The conclusion is that whilst ascarids from the pig and man are morphologically similar, there is a biological strain of pig ascaris capable of causing pneumonia in man, but incapable of reaching the adult stage in this host.

R. T. L.

NETTESHEIM (Wilhelm). **Das Wandern der Spulwurmlarven in inneren Organen.** [Migrations of Ascaris Larvae in the Internal Organs.] —*Münch. Med. Wochenschr.* 1922. Sept. 8. Vol. 69. No. 36. pp. 1304–1306. With 5 text figs.

After their emergence from the ova Ascaris larvae may penetrate the intestinal mucous membrane and reach the liver viâ the portal vessels, giving rise to focal inflammation and small abscesses by boring out of the vessels into the liver tissue; thence they may reach the lungs by the inferior vena cava, and gain the alveoli, bronchi and trachea. The alveoli are congested and peribronchitis is set up, while adjacent parts of the lungs become emphysematous. Being swallowed in the sputum, they return to the intestine. They may pass from the lungs by the pulmonary veins to the systemic circulation and the viscera. From the intestine they may travel by the lymph route viâ the thoracic duct and so reach the lungs. The author could not confirm YOSHIDA's statement that they might penetrate from the abdominal cavity through the diaphragm to the lungs.

Since the larvae, which on emergence from the ova are 0·2 mm. in length, when found in the liver are only 0·4 mm., and in the spleen, kidneys, or abdominal cavity, 0·3 mm., whereas those in the lungs may be as long as 1·5 mm., the author is of opinion that passage through the lungs is necessary for the development of the larvae.

R. T. L.

ASADA (Junichi). [**Contributions to the Knowledge of the Developmental Cycle of Ascaris.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1922. May & June. Nos. 2278 & 2283. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 323.]

Ascaris eggs will survive at low temperatures for several months unless desiccated, or in too much water, or subjected to fermentation or putrefaction. Sometimes they remain infective for over a year. The period for the formation of the infective larva in the egg is one or more weeks. The egg does not hatch in gastric juice, nor is this essential to hatching, since eggs injected into the intestine hatch well, the site probably being the small intestine, whence the larvae pass into the body cavity, through the lungs, and back to the intestine. And in the mouse, guinea-pig and rat they are then soon expelled.

R. T. L.

USAMI (Kenichi) & KAMADA (Ryonosuke). [**Complement Fixation Test in Ascariasis.**]—*Chuo Igakkwai Zasshi* (*Jl. of Central Med. Soc.*). 1921. Mar. No. 155. [Summarized in *Japan Med. World.* Tokyo. 1921. July 15. Vol. 1. No. 3. p. 23.]

The body-cavity fluid of Ascaris used as an antigen gave positive results with cases of ascariasis and ankylostomiasis. A saline extract of the female worm proved best. The author states that the complement fixation in ascariasis is not specific.

R. T. L.

HAYASHI (Shinzo). [**Resistance of the Erythrocytes of the Patient of Ascariasis against some Hemolytic Substances, and on the Influence of the Patient's Serum of Ascariasis against these Substances.**]—*Iji-Shimbun* (*Med. News*). 1922. July. No. 1097. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 326.]

Red cells in ascariasis are less fragile in hypotonic saline and in saponin solutions, and are slightly more resistant to the "normal hemolytic complement" of the rabbit than cells of normal persons. On the other hand those from very anaemic cases of ascariasis are abnormally fragile in ammonia and phenol solutions, though stronger in caustic soda solution. The antihaemolytic effect of serum and plasma is unaltered for hypotonic saline and saponin solutions; but it is abnormally effective against haemolysis by ammonia, phenol or caustic soda solution. This antihaemolysin is thermostable, and it is concluded that it is not a fatty substance, since no increase of lipoid content can be demonstrated.

R. T. L.

SCHLOESSMANN. [**Severe Disturbances induced by Ascarids.**]—*Mitt. a. d. Grenzgeb. d. Med. u. Chir.* Jena. 1921. Vol. 34. No. 1. p. 1. [Summarized in *Jl. Amer. Med. Assoc.* 1921. Dec. 3. Vol. 77. No. 23. p. 1851.]

Surgical interference was necessary for a group of cases of spastic ileus due to ascarids, 0·05 gm. of santonin three times a day for six days having had no effect; the worms were removed alive. Their numbers varied from 1 to 489. Toxic effects, two rapidly fatal, were observable in three cases. It is suggested that the helminths become more toxic during their breeding periods. Ascarids necessitated operation on the biliary apparatus of five cases, and were found in the appendices of five children.

R. T. L.

LANCELIN (R.). **A propos d'un cas de méningite helminthique accompagné de modifications chimiques et cytologiques du liquide céphalo-rachidien.**—*Bull. et Mem. Soc. Méd. Hôpit. de Paris.* 1922. Oct. 26. 3rd Ser. Year 38. Vol. 46. No. 28. pp. 1369–1372.

A soldier, aged 20 years, had the clinical symptoms of tubercular meningitis; the attack lasted ten days, and terminated two days after the expulsion of 17 ascaris. The cerebro-spinal fluid was sterile, with an excess of albumin and of lymphocytes, but no turbidity. Wassermann test was negative and blood sterile. The author does not consider it was a post-infectious meningitis resulting from a slight attack of erysipelas a week or so before; nor was it a reflex pseudo-meningitis due to the worms, since the chemical and cytological changes are against this. He cites GUIART in favour of the toxic action of helminths, and he attributes the attack to toxins generated by the infesting ascarids.

R. T. L.

AIEVOLI (E.). **L'ascaridiasi in chirurgia.** [Surgical Conditions in Ascariasis.]—*Riforma Med.* 1922. Oct. 2. Vol. 38. No. 40. pp. 946–947.

Ascaris does not enter the papilla of Vater unless the canal has been previously dilated by passage of a calculus. It may set up cholangitis, cholecystitis, and hepatic abscess, the last more commonly in the left lobe. The worm may die and become calcified, or may disappear owing to the action of proteolytic and peptolytic ferments.

H. Harold Scott.

RAMSAY (G. C.). *Combretum pilosum* **Roxb., as an Anthelmintic for** *Ascaris lumbricoides.*—*Indian Med. Gaz.* 1922. Oct. Vol. 57. No. 10. pp. 374–375.

The Nagas eat, as a cure for worms, the fruit of the jungle shrub *Combretum pilosum,* which grows luxuriantly in the plains of Cachar, India; the young leaves also are often chopped up with flour and eaten as " worm cakes." The tea-garden coolies call the shrub *Bhooree Loth,* and the Bengali villagers name it *Jhoonia Loth.* In 1920, owing to the exorbitant cost of santonin, the author used decoctions of the leaves of this plant, and found it to be a specific for *Ascaris lumbricoides* and *Oxyuris vermicularis*; it seemed to have no effect on hookworms or whipworms. The decoction is made from the powdered leaves, 2 oz. of which are boiled for twenty minutes in a pint of distilled water. This is the usual dose, but 4 oz. have been given without ill effect. Castor oil should be given on the previous evening, and also two hours after the administration of the decoction.

R. T. L.

NAKAJO (Suketoshi). [**On a Method of Complete Vermicidal Treatment of Ascaris, which has been deduced from the Extra-Intestinal Developmental Stages of the Larvae.**]—*Chugwai Iji-Shimpo* (*Internat. Med. News*). 1922. Mar. No. 1008. [Summarized in *Japan Med. World.* Tokyo. 1922. Aug. 15. Vol. 2. No. 8. p. 233.]

The author cured recurrent ascariasis in himself by the administration of santonin ten days after the faeces were free from eggs. Five repetitions secured freedom from the infection, which had persisted for many months.

R. T. L.

SCHMIDT (W. Th.). **Zur Therapie der Oxyuriasis.**—*Münch. Med. Wochenschr.* Mar. 17. 1922. Year 69. No. 11. pp. 400–401.

The author recommends the employment of aluminium subacetate as a powerful anthelmintic, harmless to the patient. The dosage is 1 gm. three times daily on three successive days for adolescents, 0·5 gm. for children, 0·5 gm. twice daily for infants. It is well to precede by a dose of calomel, " to stir up the parasites in the depth of the intestinal wall."

R. T. L.

FUCHS (Bertold). **Ueber eine Trichinenepidemie in Erlangen.** [An Epidemic of Trichiniasis in Erlangen.]—*Münch. Med. Woch.* 1922. Sept. 15. Vol. 69. No. 37. pp. 1336–1338. With 1 text fig,

An epidemic of trichiniasis occurred in Erlangen in March and April, 1922, involving some 100 persons. The disease was traced to the eating of infested pork. The early cases were diagnosed as influenza or rheumatism, but in most the symptoms were quite typical. A good picture is given showing the facial oedema and puffiness of the eyelids. Labial herpes was seen in two instances. The diazo reaction was very marked, as was also the eosinophilia, in one case as high as 78 per cent. There were no fatalities.

R. T. L.

IHLE (J. E. W.). **On** *Oesophagostomum apiostomum* **(Willach) and some Remarks on the Classification of the Strongylidae.**—*Bijdragen tot de Dierkunde uitgegeven d. h. Konin. Zoölog. Genootschap Natura Artis Magistra te Amsterdam.* 1922. Afl. xxii. p. 89–93. With 5 figs.

In a note on five specimens of *O. apiostomum* from the intestine of an orang-outang, Ihle states that this species is of common occurrence in the Philippines and has been found several times by WEINBERG in *Macacus cynomolgus* and *M. sinicus.* He agrees with the opinion of

Railliet and Henry that the specimens found in man in Northern Nigeria and ascribed by Leiper to *O. apiostomum* belong to an independent species, as Leiper's specimens differ too much in shape and measurements of the mouth-capsule, the height of the mouth-collar and the length of the spicules. Moreover, *O. apiostomum* has been found only in Asiatic monkeys. The author makes a new sub-genus, *Conoweberia,* for the species *O. apiostomum* and *O. brumpti,* with the following characteristics based upon *O. apiostomum* as type:—" Cuticle of neck inflated between the mouth-collar and the cervical groove. Cervical papillae close behind the middle of the oesophagus. No lateral cuticular membranes. The mouth-capsule has the shape of a truncated cone. Oesophageal funnel with three teeth behind the mouth capsule. Vagina long, from the vulva directed to the front."

R. T. L.

Cort (W. W.), Ackert (James E.), Augustine (Donald L.), Payne (Florence King) & Payne (George C.). **Investigations on the Control of Hookworm Disease.**—*Amer. Jl. Hyg.* 1921. Sept.–Nov. Vol. 1. Nos. 5–6. pp. 557–568; 1922. Jan. Vol. 2. No. 1. pp. 1–16. With 2 text figs.; pp. 17–25; pp. 26–38; pp. 39–50; Mar. Vol. 2. No. 2. pp. 107–148. With 3 charts, 10 figs. & 1 plan; pp. 149–161. With 1 chart & 4 figs.; pp. 162–171; pp. 172–176; pp. 177–187; May. Vol. 2. No. 3. pp. 254–263. With 3 plates.

I. General Introduction [Cort].

The purpose of the general introduction is to analyse the factors involved in hookworm control and to suggest certain lines which need further investigations. Very little precise information is available on the life of the hookworm in the soil, and its infectivity has seldom been scientifically studied. Unless the exact sources of infestation in a given area are known, only general control measures can be applied. The phases which need investigation in connection with soil problems are outlined thus:—

" *Certain phases of an investigation of hookworm in the soil.*

I. The eggs and young larvae.
  A. The distribution of the eggs over the soil.
    1. By man.
      (*a*) By direct soil pollution.
      (*b*) By accidental carriage on feet and hands.
      (*c*) By use of human excreta in fertilizing the soil.
    2. By animals other than man.
      (*a*) By feeding on human feces.
      (*b*) By human feces clinging to parts of the body.
    3. By physical agencies.
      (*a*) By rain.
      (*b*) By bodies of water.
  B. Conditions necessary for the development of the hookworm in the soil.
    1. Length of time under varying conditions that the hookworm eggs will remain alive without hatching in human stools.
      (*a*) In stools on the soil.
      (*b*) In stools in water.
      (*c*) In stools in various types of latrines.
      (*d*) In buried feces.

- 2. Hatching of eggs and development of larvae under various environmental conditions.
    - (*a*) Will hookworm eggs hatch in buried feces ?
    - (*b*) Hatching and development in various types of latrines.
    - (*c*) Conditions necessary for hatching and development when deposited on the soil or in water.
        - (1) Food.
        - (2) Moisture.
        - (3) Temperature.
        - (4) Chemical conditions.

II. The infective larvae.

- *A*. Length of life.
    - 1. Under conditions favorable for great activity.
    - 2. Under conditions which favor inactivity.
    - 3. In various types of soils.
    - 4. Length of time various soils remain infective after pollution stops.
- *B*. Conditions necessary for life.
    - 1. Amount of moisture needed.
        - (*a*) Effect of large amounts of moisture.
        - (*b*) Resistance to desiccation.
    - 2. Chemical relations.
        - (*a*) Favorable and unfavorable chemical situations in natural environment.
        - (*b*) Effect of various chemical agents.
        - (*c*) Disinfection of infested soil.
- *C*. The spread of the infective larvae.
    - 1. Active migrations.
        - (*a*) Horizontal migrations from pollution centres.
            - (1) Effect of temperature.
            - (2) Effect of moisture conditions.
            - (3) Effect of physical character of the soil.
            - (4) Effect of chemical character of the soil.
            - (5) Effect of vegetation.
        - (*b*) Vertical migrations.
            - (1) Depth of vertical migrations under favorable conditions.
            - (2) Possible upward migration when larvae are buried.
            - (3) Possible downward migration when upper surface of soil dries.
    - 2. Passive spread of infective larvae.
        - (*a*) By man.
        - (*b*) By animals other than man.
        - (*c*) By physical agencies.
            - (1) By rain.
            - (2) By streams of water.
    - 3. The distribution of infective larvae in an infested area.
        - (*a*) With respect to centres of soil pollution.
        - (*b*) In relation to disposal of human wastes.
        - (*c*) With regard to sources of human infestation."

In certain regions chickens, dogs and pigs ingest human faeces in quantity. The real significance of this in the spread of hookworm calls for investigation. So does the viability of eggs in the naturally deposited stool and in various types of latrines. Desiccation quickly kills the hookworm larvae, but investigations ought to be made to determine the minimum of moisture which the larvae require in various types of soil. It is also an unsolved problem whether the hookworm larvae can migrate into the lower layers of the soil as the upper layers become dry. Information is needed, too, concerning the actual extent to which larvae naturally migrate in the soil from centres of infestation.

II. The Description of an Apparatus for Isolating Infective Hookworm Larvae from Soil. [Cort, Ackert, Augustine & Payne (F. K.)].

The apparatus devised by Baermann in 1917 [see this *Bulletin*, Vol. 19, p. 254] has made it possible to study the activities of the infective hookworm larvae in the soil and to determine accurately the sources of infestation in any region. The underlying principle is that when the lower surface of a soil sample is brought into contact with water of a considerably higher temperature, a large proportion of the nematodes in the sample will pass into the water and can be collected and counted. The apparatus is composed of a glass funnel almost filled with water with the outlet closed by a clamped piece of rubber tubing. Half a pint or more of soil sample is placed in a brass sieve (7 in. by 3 in. with a 1 mm. mesh), which is then fitted down into a funnel 8 in. in diameter. The sieve is lined with cloth to prevent small particles of soil from sifting through the sieve. The funnel is filled with water at 115° F., to within 1½ in. of the rim, so that when the sieve is placed in position there should be no contact between the water and the bottom of the sieve. Water of the same temperature is then poured over the rim of the funnel until it is practically full and the level of the water almost an inch above the bottom of the sieve. The sample is left standing over night, and a quantity of water is then drawn off into a centrifuge tube through the rubber tubing.

Free-living Nematodes are almost always present. A few drops of 5 per cent. formalin mixed on the slide killed these, while the mature hookworm larvae, both sheathed and unsheathed, would remain active for some time. As numbers of unsheathed larvae occur in the soil, these hookworm larvae have to be identified by their structure and movements. Under favourable conditions at least 50 per cent. of the larvae experimentally inoculated into soil were recovered by this apparatus. To obtain satisfactory results, the temperature of the water must be at least 10° F. higher than that of the soil. The average percentage of larvae isolated was constantly less from saturated than from moist soil. The great majority of the larvae which can be recovered pass into the water within six hours, but an appreciable number can only be recovered after a longer period.

III. A Discussion of the Finding of Unsheathed Hookworm Larvae in the Soil. [Cort, Augustine, Ackert, Payne (F. K. & G. C.).]

Previous workers have been so influenced by the idea that the infective larvae live normally in sheaths that the occurrence of unsheathed larvae was regarded as indicative of abnormal conditions. The results of investigations made by the authors in Trinidad with Baermann's apparatus show that a large percentage of larvae complete their second moult in soil and live in the unsheathed condition. In a series of samples taken from a cacao grove, where concentrated centres of soil pollution occurred, 2,159 infective larvae were counted, of which 83·6 per cent. were sheathed and 16·4 per cent. unsheathed. In another series of samples, from a highly polluted sugar-cane field, 42 per cent. of the larvae were sheathed and 58 per cent. were unsheathed. This unsheathing appears to be greater in soil which is exposed alternately to sunlight and shade than that constantly in the shade.

IV. The Relation of the Domestic Chicken to the Spread of Hookworm Disease. [Ackert (J. E.).] See this *Bulletin*, Vol. 19, p. 663.

V. The Domestic Pig and Hookworm Dissemination. [Ackert (J. E.) & Payne (F. K.).] See this *Bulletin*, Vol. 19, p. 664.

VI. A Study of the Effect of Hookworm Control Measures on Soil Pollution and Infestation in a Sugar Estate. [Cort & Payne (G. C.).]

The results are recounted of an intensive epidemiologic study of a sugar estate in Trinidad, designed to determine the exact source of human infestation and the effect of a control campaign on human infestation, soil pollution and soil infestation. 117 out of 142 people examined from the area were found to be infested with hookworms. A series of three treatments greatly reduced the number of infested individuals and the total mass infestation of the people.

Surveys of the pollution in the cane field showed a great reduction after adequate latrines had been built and an educational campaign had been enforced. Examination of soil samples from the area showed very little soil infestation with hookworm larvae except along a heavily polluted strip of cane. This localized character of soil infestation, especially in the cane field, showed that there was little migration of infective larvae, although there was some evidence that these were carried considerable distances by water. The heavy infestation of the people was due to the prevalent habit of visiting certain places in the cane field for defaecation.

After the reduction of soil pollution in the cane field and the treatment of the people in the area, series of samples taken at intervals showed a rapid dying out of the infective larvae, so that in about six weeks soil infestation was practically eliminated.

VII. An Epidemiologic Study of Hookworm Disease in a Cacao Estate. [Cort & Payne (G. C.).]

An epidemiological study was made of the conditions influencing the spread of hookworm disease on a cacao estate with the object of locating the sources of human infestation and determining the reduction of soil infestation produced in localized centres of pollution in a cacao grove after the treatment of the people who visited these spots.

The people living in three houses on the estate showed heavy infestation with hookworms. It was found that soil pollution was almost entirely limited to definite spots in the cacao grove which had been used as "natural latrines."

Examination of soil samples revealed very little soil infestation anywhere in the area except at these natural latrines, and it is concluded that the infections were acquired there. No evidence of soil pollution was found around the houses and very little around the two barracks in the area. Where centres of soil infestation had developed in the cacao grove the examination of soil samples gave surprisingly irregular results considering the constant pollution and heavy infestation of those visiting the spots. The irregularity might be attributable to (*a*) the presence of leaves in the soil, which complicated the sampling, (*b*) variations in the degree of infestation of the people, (*c*) development, at certain spots of conditions unfavourable to the larvae.

The examinations of the soil of the intensely polluted spots six weeks after three routine treatments had been given to the people showed a very marked reduction of soil infestation, indicating that in this situation the life of the infective larvae is short. Whereas samples taken before treatment contained 1,872 larvae, those taken six weeks later revealed only 89 larvae.

VIII. **Experiments on the Migration of Hookworm Larvae in Soils.** [AUGUSTINE.]

The current opinion is that infective hookworm larvae move out from centres of infestation and spread themselves over wide areas. Experiments were made by the author in Trinidad to determine to what extent the migration of larvae occurs from definite infested centres in soils of various types and under varying conditions. The larvae used were from five to eight days old. In no case, in a series of experiments, were the larvae found to have migrated as far as four inches from the centre in where they were placed. Neither the type of soil used nor the presence of vegetation were factors in the extent of active migration of the larvae. It was noted that there occurred a remarkable reduction from the original number of larvae placed experimentally in the infestation centres, even after a week's time. The author reaches the conclusion that very probably it is only by mechanical means that hookworm larvae can spread from the place of their development.

Experiments also showed that infective larvae cannot migrate from a drying area to a moist area of soil near by; they can, however, be carried away from centres of soil infestation by surface water and can establish themselves in the new locations when the water recedes. Soil scraped from the shoes of men passing through infested areas was found to contain larvae varying in number from 2 to 344 on one person.

Domesticated animals are similarly disseminators.

IX. **On the Position of the Infective Hookworm Larvae in the Soil.** [AUGUSTINE.]

Under optimum conditions of moisture and temperature, infective larvae were found to remain on and within the upper surface of the soil. They creep up pieces of wood, decaying vegetation and other objects only as far as the film of moisture extends. Larvae were not found in the drops of water collected from the axils of the leaves of green plants nor on the leaves. At centres of soil infestation where the surface is covered with leaves or twigs the larvae were found to be extended from the leaves or twigs when moist. Even at a temperature of 101° F. and in direct sunlight the larvae were found so extended from soil particles so long as the soil remained moist. As the soil surface became drier they left their more prominent positions and were found in the deeper cracks and crevices, disappearing altogether if the drying continued, but reappearing again on the addition of water.

X. **Experiments on the Length of Life of Infective Hookworm Larvae in Soils.** [AUGUSTINE.]

Laboratory experiments and field observations in Trinidad show that the life of hookworm larvae is limited to six weeks in the soils of Trinidad, where the daily temperature ranged from 74° F. to 94° F., a temperature which tended to keep the larvae active and consequently to exhaust rapidly their food reserve. A large proportion of the larvae lost their sheaths in the soil. This completion of the second ecdysis presents a new factor in determining the length of life of the larvae, for it renders them more susceptible in unfavourable environments. The unsheathed larvae were shown experimentally to be still infective.

XI. **Vertical Migration of Infective Hookworm Larvae in the Soil. (Preliminary Report.)** [PAYNE (F. K.).]

Practical hookworm control may be affected by the possible retirement of the larvae during dry weather from the surface to zones of greater moisture, and by the possible upward migration of larvae which are beneath the surface. Studies of these migrations should assist in evaluing methods of excreta disposal. The author has conducted careful experiments to determine whether larvae buried at a known distance can reach the surface in sufficient numbers to produce an infective focus. The results show that in garden soil with uniform conditions of moisture throughout very few larvae of *Necator americanus* migrate more than two inches above the point of inoculation. In water-logged soil of the same type there was little migration and apparently a very high death-rate. In garden soil in which conditions of rising ground-water were simulated 74·4 per cent. of the larvae found had migrated three or more inches, 15·4 per cent. five or more inches, while a few had migrated more than 7½ in. Migration was apparently more difficult in specimens of fine sand and mixtures of clay and sand than in garden soil. A diminution in the food granules in the gut-wall of the larvae was noticeable after vertical migrations of only one or two inches, and their almost complete disappearance occurred in those which had migrated for five or six inches.

R. T. L.

DE NOOIJ (J. A.). **Onderzoek naar het voorkomen van ankylostomenlarven in den grond in kampongs te Batavia.** [Research concerning the Presence of Ankylostome Larvae in the Soil of Native Villages at Batavia.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 290–305.

Using BAERMANN's method (see this *Bulletin*, Vol. 12, p. 181), the author examined samples of soil in the native villages for hookworm larvae. The surroundings of the primitive privies were found to be the most infested spots. The differentiation between hookworm larvae and those of free-living nematodes is discussed. In their larval stage dogworms (*Ancylostoma ceylanicum*) cannot be distinguished from human hookworms. An experiment showed that flies, as well as their larvae, may transmit the hookworm larvae. This may be important for the spread of hookworm infection in certain circumstances. Contrary to the opinion of Looss that " the mature ankylostoma larvae cannot withstand desiccation even for the space of a second," de Nooij found that the larvae can bear a considerable degree of desiccation. After 24 hours in the incubator at 37° C. and 1½ hours' exposure to the sun they could be easily revived by contact with water. An occasional laboratory infection with canine hookworms did not result in appearance of the ova in the faeces.

W. J. Bais.

i. MINAGAWA (Koki). **Supplemental Studies on the *Anchylostoma duodenale* Dubini.**—*Mitt. a. d. Med. Fak. d. Kais. Univ. Tokyo.* 1920. Vol. 23. No. 2. pp. 149–170.

ii. ——. **Experiments in the Prevention of the Hookworm Disease.**—*Ibid.* pp. 171–187. With 2 plates.

i. The development of hookworm ova and larvae succeeds better in water than in moist air. The depth of pure water does not adversely affect development, but when the water is putrescent, or contains easily oxidizable substances, the ova and larvae, save in very shallow fluid, remain quiescent or die. When faeces containing ova is diluted, the duration of the latent life of the ova is in direct proportion to the dilution and in inverse ratio to the density. In faecal matter floating on water the ova complete their development, and in this supernatant matter the encysted larvae can survive, but they die when it sinks. In greatly diluted faeces the ova retain vitality longer if the receptacle is an open one. Carbonic acid, ammonia and other gases dissolved in water act destructively upon the vitality of the ova. A 1 per cent. solution of ammonium carbonate destroys hookworm ova in five days. Human urine is very efficient against hookworm ova.

ii. Using *Ancylostoma caninum* ova derived from dogs' stools, the author made a series of experimental tests of the practical value of admixing urine with infected faeces. The faeces were mixed with human urine and left to putrefy and ferment for ten days. The mixture was then scattered in experimental pits in the same manner as a farmer manures land in Japan. Later several young dogs were placed in these pits. As controls similar mixtures were made with water and similarly used. In the dogs placed in the pit fertilized with the urine-faeces mixture the largest number of hookworms found was 26. In the dogs placed in the pit manured with the mixture of faeces and water the worms found exceeded 10,000. It follows that putrefaction and fermentation of faeces is insufficient to destroy hookworm ova, but when ammoniacal fermentation is effectively induced the destructive action is great. The experiments point to practicable measures for the eradication of hookworm in the Far East.

R. T. L.

CIFUENTES LABASTIDA (R.). **La anquilostomosis como coeficiente importante de la despoblación venezolana. Su enorme difusión en el territorio. Vias de penetración. Ligero estudio comparativo con otras enfermedades que diezman la población. Proyecto de profiláxia contra el Anquilostomo.** [Ankylostomiasis an Important Factor in the Depopulation of Venezuela. Its Extensive Prevalence. Portals of Entry. Comparison with other Decimating Diseases. Scheme for Prevention.]—*Gac. Méd. de Caracas.* 1921. Sept. 30. Vol. 28. No. 18. pp. 283–287.

Successive census returns reveal the fact that the population of Venezuela remains almost stationary in spite of the fact that the birth-rate shows a satisfactory increase. Malaria is well known but, as the treatment and preventive measures are universally recognized, this disease is not as fatal now as in former days. Tetanus and puerperal fever are also causes easily remediable by education on the one hand and by the institution of legal measures to regulate practice by untrained midwives on the other. Tuberculosis, which contributes largely to the mortality returns, is also becoming a less potent factor.

The geographical distribution of hookworm in Venezuela shows that the prevalence is less among the parts which are supplied with filtered water, and that the children in such districts are often infected through the habit of geophagy. Greater stress is laid on infection by the alimentary route than by the cutaneous. Other modes are mentioned, such as the infection of pottery workers, who mould the clay with their hands; of those who are employed in plastering walls, in which earth is used; those engaged in agriculture; in fact all those who soil their hands with earth and transfer the ova and larvae to their noses and mouths.

" Ground itch" is often complained of in the earliest stages, and is known locally by the name of " sabañones " [literally, chilblains], but this mode of infection is not the commonest, since workers on land impregnated with ova and larvae are, he states, relatively few.

The author takes a somewhat pessimistic view of the effect of treatment. The anaemia and other debilitating results of infection do not readily clear up and are often permanent, and the patient becomes an easy victim to intercurrent disease. The juice of Higueron is most satisfactory.

The author recommends that the numerous local springs and sources of supply should be fitted with filters. These should be covered with galvanized iron and a trained man put in charge to repair defects and renew the filtering medium when needed.

H. Harold Scott.

BURGA (Buenaventura). **Demostración de la existencia de la anquilostomiasis en la provincia de Moyobamba donde se la llama poshequismo.** [Ankylostomiasis (locally Poshequismo) in Moyobamba.]—*Cronica Méd.* Lima. 1921. Aug. Vol. 38. No. 698. pp. 274–278.

The inhabitants of Moyobamba, the capital of San Martin in the Andes, are much infected with hookworm. Here and in the Rioja district, where rains are heavy, the soil damp, and the relative humidity very high, 90 per cent. of the men were found to harbour ankylostomes. In Tarapoto, in the same department, but with a warm dry atmosphere and little rain, ankylostomiasis is rare. The men are affected to a much greater extent than the women ; the former live by agricultural work, the latter by hat-making. They are poor and underfed, they live in insanitary surroundings, and nearly all suffer from malaria, which is allowed to go untreated owing to the high cost of quinine.

The author treats his hookworm patients with thymol by the 45-gr. method divided into three doses, and reports great success. Oil of chenopodium was abandoned because of the toxic symptoms produced. After expulsion of the worms he treats the anaemia with protoxalate of iron, of which he speaks highly.

H. Harold Scott.

LEGER (Marcel). **L'infestation par ankylostomes à la Guyane française.** —*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. April–May–June. Vol. 19. No. 2. pp. 135–146.

An historical analysis is followed by an account of the present degree of infestation, which appears to be characterized by a high percentage of sickness amongst the infected. The conclusion is that the serious nature of the problem requires vigorous educational, hygienic and therapeutic measures.

R. T. L.

KOFOID (Charles A.) & TUCKER (John P.). **On the Relationship of Infection by Hookworm to the Incidence of Morbidity and Mortality in 22,842 Men of the United States Army at Camp Bowie, Texas, from October 1917 to April 1918.**—*Amer. Jl. Hyg.* Baltimore. 1921. Jan. Vol. 1. No. 1. pp. 79–117. With 3 text figs.

A survey of 22,842 men at Camp Bowie, Texas, showed 3,079, or 13·5 per cent., positive for hookworm.

Positives for hookworm showed an apparent increased susceptibility for tonsillitis, laryngitis, bronchitis, pneumonia and measles, due in part to rural isolation and lack of previous attacks by these infections, and to rural conditions favouring hookworm infection. Morbidity and mortality from many causes and the incidence of mortality from pneumonia showed a general correlation with that of hookworm infection. Hookworm is one of a vicious circle of factors favouring inefficiency, morbidity and mortality among U.S. army troops. It would be more profitable to eliminate infection from every soldier on recruitment than to allow him to remain untreated.

R. T. L.

KOFOID (Charles A.). **The Geographical Distribution of Hookworm Infection in the United States, detected in Army Recruits.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 389–396.

501,472 recruits from all parts of the United States were examined during the war for hookworm, by a single examination as a rule; 11·3 per cent. were positive. An analysis was made of the States in which 126,140 men were born. 114,408 came from the Southern States and the infection rate was 17·01 per cent. Of these 3,872 came from Georgia, having the highest rate, 32·6 per cent.; the District of Columbia and Missouri had the lowest, 1·6 per cent. and 1·8 per cent. respectively. Recruits from the Mississippi Valley showed 1·69 per cent. positive (5,664 examined), those from the Pacific Slope 2·5 per cent. (1,710 examined), and from the North-Eastern States only 0·84 per cent. (4,358 examined) were infected with hookworm.

Reference is made to the reduction of intellectual efficiency, stated by MYERS (1920) and WAITE (1919) [see this *Bulletin*, Vol. 18, p. 135] to be 25 per cent., and also to the writer's own article in conjunction with TUCKER (1921) [see above] on the incidence and severity of other diseases in persons infected with hookworms.

R. T. L.

DARLING (Samuel T.). **Recent Researches on Hookworm Infection in Indonesia.**—*Indian Med. Gaz.* 1919. Dec. Vol. 54. No. 12. pp. 446–453.

Slight ankylostomiasis, unaccompanied by malaria, usually shows no anaemia, since compensation is established. But when the worm index runs into hundreds, the worm count and the anaemia are reciprocal for a large similar group of people; individuals vary greatly in their haemopoietic powers. The percentage of haemoglobin depended on the sex and age, and on pregnancy; and comparing different kampongs in Java, depended also upon the incidence of malaria, in which condition there was no close correspondence between the degree of anaemia and the number of hookworm harboured. In cases with a measurable amount of anaemia the author found that a loss of 1 per cent. of haemoglobin was occasioned by 11·7 worms in men, 10 in women, and 7·6 in boys. The advantage of treatment of coolies is shown below.

	Change in Haemoglobin.
Free from malaria, treated for hookworm, sent to non-malarial estates	+15·2 per cent.
Free from malaria, not treated for hookworm, sent to non-malarial estates	+ 6·0 ,,
Free from malaria, treated for hookworm, sent to malarial estates	− 5·7 ,,
Free from malaria, not treated for hookworm, sent to malarial estates	−10·44 ,,
Infected with malaria, treated for hookworm, sent to malarial estates	+15·8 ,,
Infected with malaria, not treated for hookworm, sent to malarial estates	+11·7 ,,

The author found oil of chenopodium, 3 cc. in three divided doses, the most efficient vermifuge ; this removed 96·8 per cent. of necators and 76·6 per cent. of ankylostomes ; two treatments with 1·5 cc. in divided doses removed 99·03 per cent. of worms.

The initial purge may be omitted, and a light diet is necessary, but complete or almost complete starvation remarkably diminishes the number of worms removed.

R. T. L.

SMILLIE (Wilson G.). **A Comparison of the Number of Hookworm Ova in the Stool with the Actual Number of Hookworms harbored by the Individual.**—*Amer. Jl. Trop. Med.* 1921. Nov. Vol. 1. No. 6. pp. 389–395. With 1 chart in text.

The number of ova in the stools frequently gave no trustworthy index to the number of hookworms harboured. When cases were considered in groups there was a definite and fairly constant correlation. From a study of 135 cases it is shown that great variations appear. An individual harboured as many as 28 hookworms, and yet the stool gave a negative microscopic result. Another individual presented a stool specimen in which the ova could only be found by the centrifuge method, yet 168 hookworms were found to be present by subsequent treatment. In a further case a single female hookworm alone was present, yet the microscopic examination of the stool showed a considerable number of ova. In 18 out of 135 cases the microscopical results were negative, but in these only a few worms were present.

R. T. L.

CORT (William W.). **A Graphic Analysis of Certain Factors in Hookworm Control.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 449–462. With 1 text fig.

The worm index is the only guide to effect of a hookworm campaign. Examination for ova returns as positive persons who harbour only a few worms, and thus may reveal no apparent improvement, whereas the average number of worms may have been reduced from hundreds to units. The haemoglobin index is of some value (this may be masked by endemic malaria). The estimation of the number of eggs is of some value when dealing with large communities; individually it is valueless. Soil infestation estimates are valuable, but depend on climatic conditions. A number of hypothetical graphs of the relation between soil pollution, soil infestation and human infestation, based on present knowledge, shows that mass treatment is very effective, sanitary measures alone are practically useless; the best possible combination being sanitary measures carried out for the period of the life of the larvae in the soil followed immediately by mass treatment, producing simultaneously low infestation both of the soil and the host. It is suggested that dry or cold seasons, when climatic conditions cause low soil infestation, might be utilized for occasions for mass treatment.

R. T. L.

McVail (J. Borland). **Annual Report of the Work of the Hook Worm Research Laboratory.**—*Ann. Report of Work done in the Calcutta School of Trop. Med. and Hyg. under the Endowment of the Indian Tea, Jute and Mining Association.* [1921.] pp. 37–50.

Clayton Lane's "Levitation" method has proved satisfactory, but a simpler method not necessitating the use of so much apparatus is recommended. About half a gramme of stool is shaken vigorously in a test tube with the minimum quantity of water which will produce a thick fluid emulsion. This is poured on to a slide in a space between grease-pencil boundaries and allowed to stand for ten minutes. The slide is then immersed gently in water to float off the debris and examined under the microscope. Although hookworm is called a disease of the tropics the development of the ova is almost totally inhibited at a temperature of 98·4° F. Mature larvae kept in water at this temperature soon show degenerative changes, the capsule becomes soft and sticky, and within 14 days or less most are dead. The author suggests that it might be possible to utilize the heat of natural fermentation to devise a temporary latrine in which faeces would be sterilized from hookworm. The effluents of 59 septic tanks were examined, and eggs or larvae of hookworms were found in 19. Ordinary clothing is readily penetrated by the larvae, but closely woven materials can be proofed temporarily with boiled linseed oil. As wet leather is penetrated a linseed oil soaking may be useful for boots to be worn by planters in rainy weather or marshy soil. Sterilization of soil requires chemicals of too high concentration to be commercially practicable. Sunlight kills the larva by temperature. In the laboratory a few larvae were found to penetrate unscreened sand to a depth of 7 inches in a week.

R. T. L.

de Almeida, Junr., & Pessoa (Samuel B.). **A prova de Schneider nas crianças e nos ancylostomados.** [Schneider's Test in Children and in those Infected with Hookworm.]—*Brazil Medico.* 1922. Nov. 25. Year 36. Vol. 2. No. 47. pp. 331–335.

Schneider's test, originally brought forward as a "Cardio-vascular Rating as a Measure of Physical Fatigue and Efficiency," with a system of scoring by points the various results obtained from different examinations, such as the pulse-rate when recumbent, the increase on rising, the rate when standing, the increase immediately after exercise, the time taken for it to return to normal after exercise, etc., showed, as would be expected, departures from the normal in hookworm cases, namely, a lowering of physical resistance and earlier onset of fatigue. The patients examined by the authors were but slightly infected, and they conclude that the differences were too small to warrant their making any deductions of value from the test.

H. Harold Scott.

FLU (P. C.). **Onderzoekingen over de oorzaken der anaemie bij ankylostomiasis.** [Cause of Anaemia in Ankylostomiasis.]—*Tijdschr. v. Vergelijkende Geneesk. enz.* 1922. Jan. 23. Vol. 7. No. 1. pp. 47–71. [English Summary, pp. 71–72.]

The author considers that anaemia in ankylostomiasis is due chiefly to the small but repeated haemorrhages produced by the worms, and he cites examples of profuse haemorrhages caused by hookworms. In support of his supposition he mentions also the presence of an anticoagulant in the anterior part of the worm and the absence of haemolytic or haemotoxic substances in the watery extract of the anterior part of the adult worm.

R. T. L.

MCVAIL (J. Borland). **The Blood Count in Ankylostomiasis. A Warning.**—*Indian Med. Gaz.* 1922. Oct. Vol. 57. No. 10. pp. 366–367.

A comparison is made of a number of differential counts of cases of :—(*a*) ankylostomiasis uncomplicated with malaria ; (*b*) ankylostomiasis and malaria ; (*c*) ankylostomiasis and kala azar.

(*a*) Average leucocyte count 10,482·5 ; eosinophiles 19·3 per cent., 2,781 per cmm.

(*b*) Average leucocyte count 7,083·3; eosinophiles 11 per cent., 834 per cmm.

(*c*) Average leucocyte count 4,457; eosinophiles 1·7 per cent., 76·78 per cmm.

The conclusion is that cases of ankylostomiasis showing little or no eosinophiles should be examined at once by spleen puncture or Napier's test.

R. T. L.

LEMIERRE (A.) & LANTUÉJOUL (P.). **Evolution de l'éosinophilie sanguine au cours de l'ankylostomose duodénale. (A propos d'un cas personnel.)**—*Ann. de Méd.* 1920. July–Dec. Vol. 8. pp. 409–417.

In a case having 50 per cent. haemoglobin and 16 per cent. eosinophilia, treatment caused the eosinophilia to rise, in three weeks, to 37 per cent., and the haemoglobin to 70 per cent. ; after which period the haemoglobin continued to rise and the eosinophilia gradually fell to 7·8 per cent. five months later. This is contrasted with the rapid and immediate fall observed after the removal of hydatid cysts. It is suggested that whilst the toxic effect of the worms causes a continued abnormal output of eosinophiles, the removal of the worm results in the immediate diminution of local eosinophilia of the intestine causing a rise of eosinophiles in the peripheral blood. The coincidence of anaemia and a low eosinophile count, and the rise of eosinophiles accompanying the early stages of increase of haemoglobin, are discussed.

R. T. L.

HAYASHI (Shunzo). **[On Hemolytic and Antihemolytic Substances found in the Serum of Ankylostomiasis. (1. Communication.)]**—*Chuo Igakkwai Zasshi* (*Jl. of Central Med. Soc.*). 1921. May. No. 156. [Summarized in *Japan Med. World*. Tokyo. 1921. Oct. 15. Vol. 1. No. 6. p. 18.]

Serum from a case of ankylostomiasis with slight anaemia contained thermostabile antihaemolysins, but the author was unable to demonstrate that the serum had been affected by haemolytic substances in the body of the worm. In cases with a medium degree of anaemia the serum was less haemolytic for goat corpuscles than normal serum or serum from cases of ascariasis; indeed in the last disease the haemolytic action is sometimes increased. The normal amboceptor of the human serum is unaffected by heating to 56° C., but markedly weakened by a temperature of 62° C.

R. T. L.

FÜLLEBORN. **Nachweis von Ankylostomen und Strongyloides durch Plattenkotkultur. (Vorläufige Mitteilung.)**—[Detection of Ankylostomes and Strongyloides by Plate Culture. Preliminary Communication.]—*Arch. f. Schiff- u. Trop.-Hyg.* 1921. Vol. 25. No. 4. pp. 121–123. With 1 text fig.

A combination of LOOSS and BRUN's method of stool culture with the agar plate technique is advocated for the detection of ankylostoma and strongyloides.

Ordinary amoeba agar is employed. In the centre of the plate faeces is spread ½–1 cm. thick, a free edge of at least 3 cm. being left around the dish. In a few days the growing worms become visible even to the naked eye on account of the tracks they make. Such a plate is easily examined by microscope—if worms are scarce, a piece of agar is cut out and the hole filled with water, into which the worms creep; the whole plate may be covered with water if preferred. Greatest development takes place at 25–30° C.; higher temperatures affect the sexual generations of strongyloides adversely. At 27° C. the first strongyloides filariform larvae (arising without intervention of adults) are seen, and their tracks appear after 24 hours. At this temperature the first ankylostome tracks appear only after 48 hours. The first ripe larvae of *Ancylostoma duodenale* and *Necator americanus* appear after three to four days.

R. T. L.

GORDON (R. M.). **The Occurrence of Ancylostomes resembling *Necator americanus* amongst Domestic Pigs in Amazonas.**—*Ann. Trop. Med. & Parasit.* 1922. Oct. 18. Vol. 16. No. 3. pp. 295–296.

Fifteen pigs were examined at Manaos on the Amazon. These were of the domestic variety and had been kept in or around native dwelling-houses. Their ages varied from young "sucking-pigs" to full-grown adults. In ten of the pigs ankylostomes corresponding with *Necator americanus* in all respects, except that of size, were collected. In one animal, 75 worms occurred. The total number collected was 175. Twenty-eight males varied in length from 6·5 mm. to 4·5 mm., averaging 5·1 mm. Sixty-four females ranged from 8·2 mm. to 5·5 mm., averaging 6·5 mm. The spicule of the male averaged 0·48 mm. in 12 specimens. Some of the females were gravid [but no measurements of the eggs are given]. The author considers that the pig, in this locality, plays a part of some importance in the spread of ankylostomiasis. No specimens of *A. duodenale* were found, but the author has examined and confirmed the discovery of *A. duodenale* in pigs at Townsville, Australia. He refers also to Dr. O'CONNOR's earlier record from Samoa [concerning the validity of which some doubt exists].

R. T. L.

i CAIUS (J. F.) & MHASKAR (K. S.). **An Inquiry into the Correlation between the Chemical Composition of Anthelmintics and their Therapeutic Values in Connection with the Hookworm Inquiry in the Madras Presidency. A Progress Report.**—*Indian Jl. Med. Res.* 1921. Apr. Vol. 8. No. 4. pp. 737–740.

ii. —— & ——. **The Correlation between the Chemical Composition of Anthelmintics and their Therapeutic Values in Connection with the Hookworm Inquiry in the Madras Presidency. XVI. Propenyl Phenols.**—*Ibid.* 1922. Oct. Vol. 10. No. 2. pp. 343–360.

i. The compounds examined to date are classified chemically and these classes compared.

(*a*) No anthelmintic properties : *Hydrocarbons, e.g.*, oil of turpentine ; *Alcohols, e.g.*, ascaridole glycol from oil of chenopodium ; *Aldehydes* ; *Ketones, e.g.*, santonin and liquid extract of male fern ; *Alkaloids, e.g.*, Pulvis arecae ; *Polyhalides*, chloroform may be useful as a narcotic coupled with a purge.

(*b*) Vermicidal but not vermifugal : *Oxides, e.g.*, eucalyptol weak ; *Peroxides, e.g.*, ascaridole very strong.

(*c*) Vermicidal and vermifugal : *Phenols*, their value may be diminished or destroyed by substitution in the benzene ring ; the most efficient are mono-phenols of di-substituted benzene compounds.

ii. Pseudoallyl phenols do not occur naturally, but allyl and isoallyl derivatives are found in many of the essential oils, and are all characterized by the presence of phenolic hydroxyl in the *para* position to the C_3H_5 side chain ; and it is these two latter classes of compounds which have been examined. These have marked anthelmintic properties, which do not appear to be dependent upon the configuration of the propenyl group, but upon the condition of the *hydroxy* group in the *para* position. Esterification weakens or destroys the anthelmintic power, whereas etherification, whilst weakening or destroying the vermifugal effect, only in certain cases modifies the vermicidal character of the derivatives. The authors find that whilst the vermicidal action of the methyl ether resembles that of thymol or β-naphthol that of the methylene ethers resembles oil of chenopodium.

R. T. L.

MHASKAR (K. S.). **Mass Treatment of Hookworm Infection.**—*Indian Med. Gaz.* 1922. June. Vol. 57. No. 6. pp. 208–210.

Fifty-four substances were investigated, and the conclusion was that oil of chenopodium, thymol and β-naphthol were the only effective drugs; excepting chloroform under hospital conditions. The first varies greatly in composition, being easily adulterable, does not keep well, and is highly toxic; therefore the determination of the optimum dose is a matter of difficulty and is of great importance. Thymol and β-naphthol can be obtained chemically pure, and being much less toxic do not require an after-purge nor restriction of food. The optimum dose is 50 gr., but should be reduced for debilitated persons in the case of β-naphthol, which is much the cheaper drug. This treatment need not be repeated, as apparent failures generally result in delayed cures [see paper by same author, this *Bulletin*, Vol. 19. p. 662], and 93 per cent. of cures was experienced with this treatment. The work was carried out on a large number of cases both in Trichinopoly jail and on tea plantations.

R. T. L.

DARLING (Samuel T.). **The Hookworm Index and Mass Treatment.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 397–447. With 3 text figs.

The worm index is the only reliable guide, both to the number of persons infected and to the heaviness of infection. It is this latter point that is important. Heavily infected areas should be dealt with before places with a low worm index; both because a light infection is innocuous whilst a heavy one means more or less severe anaemia and poor general health, and because a high worm index entails a high infestation of the soil. Populations with a high worm index require mass treatment, *i.e.*, all must receive vermifuges within a short space of time. The average life of the larva being four weeks in the tropics, the soil pollution will diminish rapidly, and since the parasites are acquired slowly, about 12 worms a year in the Javanese, a high index will not be attained from a lightly infested soil and a lightly infested population cannot restore a heavily infested soil. The author considers this method quite possible, even with difficult races, whereas it is almost impossible to alter tribal and religious hygienic customs. He indicts heavily the latrines usually provided, as "filthy" and generally placed at an inconvenient place and too far from places of occupation on plantations. It is undesirable to waste time and funds on trying to get complete cures. One treatment cures 28 per cent., but removes 90 per cent. of the worms. Two treatments cure 49 per cent., but remove 97 per cent. of the worms.

The article deals with the Orient. The degree of infestation is dependent on occupation and personal hygiene, as is shown by a low worm index for town populations, a higher one for fishing villages and "protected" agricultural populations (*i.e.*, those provided with latrines which some use), and highest for unprotected agricultural populations. Mountain districts are unaccountably low, and the worm index for boys is higher than for anyone else. Usually the men have the highest W.I. (worm index), then the boys, then the women, and then the girls. But this is not a sex phenomenon, as on rubber estates where Tamil women work at the trees and the children weed and the men work indoors, the figures are reversed.

Comparing Javanese coolies, it was found that "Road Coolies" had a W.I. of 102, and had 1·69 *Ancylostoma duodenale*; "Night-soil Coolies," *i.e.*, those who carried away and buried the faeces of the Chinese population, had a W.I. of 169, and had 14·4 *A. duodenale*: the higher proportion of *A. duodenale* confirms the fact that they were infected by their occupation, since the Chinese have a larger number of ankylostomes than the natives. These ankylostomes are acquired at the rate of about three per annum. The racial hygiene varies greatly: the Tamils defaecate anywhere; the Chinese and Mohammedans are required to perform ablutions of the anus and genitalia after defaecation or urination, and generally choose a stream or pond. About half the Javanese defaecate into streams in which they wash their bodies, their clothes and their food. The author suggests that the higher degree of infestation among the white people in the Southern States of America is due to their using privies or the barnyard, whilst the negroes, defaecating anywhere, spread their faeces over a wide area and produce a lighter infection.

R. T. L.

ROUSSEAU (Louis). **Quelques observations relatives au traitement de l'Ankylostomiase.**—*Bull. Soc. Path. Exot.* 1922. Feb. 8. Vol. 15. No. 2. pp. 127–131.

Twenty-four prisoners on the Iles de Salut, French Guiana, infested with ankylostomes (chiefly *A. duodenale*) were treated with various vermifuges. The best results were obtained with chloroform (4 gm.) and bromoform (3 gm.); β-naphthol and thymol were inferior. Essence de Niaouli had a slight ankylostomicidal action, and male-fern had no value, the results obtained being solely attributable to the chloroform in the preparations. Eucalyptus was useless. Castor oil (30 gm.) accompanied all vermifuges except thymol and β-naphthol, with which a saline purge was used. Oxyurids were very common. The author corrects an error made by him (*Bull. Soc. Path. Exot.*, 1921, Feb., p. 130): he mistook oxyurids, males and immature females, for the intestinal form of strongyloides killed and expelled by thymol, though his observations on the other forms of strongyloides are confirmed.

R. T. L.

HALL (Maurice C.). **The Use of Carbon Tetrachloride for the Removal of Hookworms.**—*Jl. Amer. Med. Assoc.* 1921. Nov. 19. Vol. 77. No. 21. pp. 1641–1643.

The author, aged 40 years, has tested the drug on himself:—Light breakfast, three hours later 3 cc. carbon tetrachloride in hard gelatine capsules—pulse 90. Seven minutes later eructation of carbon tetrachloride and for half an hour a feeling of warmth in the stomach. Forty minutes later pulse 78. An ordinary day's work was done, eating and smoking were not interfered with, and more than the average amount of exercise was taken. There was no constipation, the drug having apparently a mild laxative effect.

Reference is also made in the paper to unpublished work on the treatment of horses and swine, from which it appears that this drug is very effective against blood-sucking strongyles and moderately effective against ascarids.

R. T. L.

LEACH (C. N.). **Carbon Tetrachloride in the Treatment of Hookworm Disease.**—*Jl. Amer. Med. Assoc.* 1922. June 10. Vol. 78. No. 23. pp. 1789–1790.

A trial of this newly discovered anthelmintic was made on 14 selected prisoners at Kandy. In a previous experiment 110 gr. β-naphthol had been given and an average of eight hookworms recovered; using carbon tetrachloride an average of 58·7 from 14 cases resulted. A dose of 10 cc. produced only slight giddiness and nausea. It was found that this dose, followed a week after by one of 2 cc., removed all hookworms and ascarids. A post-mortem examination showed, however, that it had little or no effect on oxyuris and trichuris, and also that no microscopic changes could be detected in any tissues.

R. T. L.

NICHOLLS (Lucius) & HAMPTON (G. G.). **Treatment of Human Hookworm Infection with Carbon Tetrachloride.**—*Brit. Med. Jl.* 1922. July 1. pp. 8–11.

Experiments were carried out on school children and on agricultural students, and carbon tetrachloride was found to expel hookworms, ascarids, oxyuris (*cf.* LEACH) and trichuris, but it was not so efficient in killing ascarids as oil of chenopodium. The authors suggest the admixture of one part of oil of chenopodium in four parts of carbon tetrachloride for the treatment of ascariasis.

R. T. L.

HAMPTON (G. G.). **Use of Carbon Tetrachloride for Removal of Hookworms in Human Beings. A Preliminary Report.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 381–387.

Doses of 3 cc. to 10 cc. were given to 14 prisoners at Kandy jail; no ill-effects were observed, and ascarids and hookworms were passed. Trichocephalus and oxyuris appeared to be unaffected. On post-mortem of an executed criminal who had had 6 cc. of carbon tetrachloride no changes, gross or microscopic, attributable to the drug, were found in the viscera. Twenty students, all positive for hookworm, had each 3 cc. of carbon tetrachloride administered in water. Hookworms were recovered from 19, and a complete cure was effected in 18. Eleven were positive for ascaris, and specimens were passed by six. One was positive for oxyuris and 14 for trichocephalus. No trichocephalus were recovered. An analysis is made of the relative cost and efficiency in Ceylon of carbon tetrachloride and oil of chenopodium in hookworm treatment.

	Cost per lb.	Dose.	Purge.	Percentage Cure.
	s. *d.*			
Oil of chenopodium..	30 0	1·5 cc.	Mag. sulph.	30–50 %
Carbon tetrachloride	3 0	3·0 cc.	None.	90 % (20 cases).

R. T. L.

BAIS (W. J.). **Tetrachloorkoolstof als mijnwormmiddel.** [Carbon Tetrachloride against Hookworms.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 381–393.

Following the suggestions made by HALL (see above), a trial was given by the author to carbon tetrachloride in the treatment of hookworm disease in Javanese coolies in Sumatra.

He administered carbon tetrachloride in a dose of 2·5 cc. in capsules on an empty stomach, followed after two and a half hours by 20 cc. of castor oil. As a standard control a similar cure with 1·4 cc. chenopodium oil was employed.

Chenopodium oil as a first cure expelled 71 per cent. of the total number of worms removed, leaving 29 per cent. to the carbon tetrachloride cure.

If carbon tetrachloride was given first, followed by the chenopodium control, the percentage of worms removed by carbon tetrachloride was 95·2, that expelled by chenopodium oil 4·8 per cent. of the total.

In the first series of experiments (33 patients, average number of worms 311) 6 per cent. of the patients lost no worms by the second cure ; in the second series (39 patients, average number of worms 160) 60 per cent. of the patients were free from hookworms after the carbon tetrachloride cure.

The effect of the cure was influenced neither by omission of the laxative (17 patients), nor by administration of the drug without fasting (preceding meal two hours before the cure) to patients.

No untoward effects were noted ; the drug is easily taken and very cheap.

W. J. Bais.

MEYER (J. R.) & PESSÔA (Samuel B.). **Estudos dos effeitos toxicos do tetrachloreto de carbono.** [A Study of the Toxic Effects of Carbon Tetrachloride.]—*Brazil Médico.* 1922. Sept. 23. Year 36. Vol. 2. No. 38. pp. 173–179.

Patients to whom large doses of carbon tetrachloride had been given often complained of pain in the loins and sometimes suffered with haematuria.

Experiments with animals were made to test the effects of various doses and methods of administration. The dosage was graded to the body weight, and according as it increased the animals became drowsy, or vomited, or died. The chief alterations were found to be in the liver and kidneys.

The authors cannot agree with the findings of HALL and SHILLINGER [cited by LAKE], who, they say, gave as much as 300 cc. of the drug in a single dose to a dog without toxic effects. In these experiments even 1 cc. produced liver changes in two instances and renal in one.

Their main conclusions are :—

1. The toxic effects begin to manifest themselves even with a small dose—0·05 cc. per kilo body-weight.
2. The changes are most marked in the liver and kidneys, and vary in direct ratio with the age of the experimental animal.
3. The necrosis of the liver cells occurs in the same way as that resulting from chloroform poisoning.
4. Measures tending to prevent absorption by the intestinal mucous membrane [*e.g.*, the use of purgatives] diminish the intensity of the lesions.
5. Though the liver changes appear early, those in the kidneys do so only after a considerable interval, and the latter are the result of the action of the poison in course of elimination.
6. Carbon tetrachloride is a powerful vermifuge ; in doses of 0·2 cc. per kilo it expels all the ankylostomes from a dog.
7. Its action may be explained as a direct one on the worm itself.

H. Harold Scott.

ROTH (David A.). **Some Dangers of the Chenopodium Treatment.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1918. Jan.–June. Vol. 11. Pt. 1. pp. 83–91.

Of 103 cases treated with oil of chenopodium which were specially observed, 29 showed symptoms, *e.g.*, dizziness, nausea and vomiting, headache and general depression, and 21 showed deafness. The deafness was by far the most disagreeable after-effect, varying in intensity from very mild to complete loss of hearing lasting from one week to several months. In four cases some deafness persisted after two years. Two of the cases quoted illustrate the important fact that a dose which causes no untoward effects at first may produce the severest type of reaction when repeated within a few days. The author is of opinion that chenopodium is a depressant poison capable of producing serious untoward effects and even death. It should not be administered unless there be ample facilities for study of the cases before and after administration. This should include a careful determination of the percentage of haemoglobin, for it should not be given to those suffering from a high degree of anaemia. The treatment should not be repeated within ten days. During the year 1917 four deaths were noted in the records of Santo Tomas Hospital.

R. T. L.

WALCH (E.). [In Dutch and English.] **Het afdrijvingsvermogen van oleum chenopodii, bereid op de Gouvernements Rubberonderneming Balong. On the Purgative Power of Oleum Chenopodii, manufactured at the Government Rubber Estate, Balong.**—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1920. Pt. 8. pp. 90–119.

The chenopodium oil manufactured at Balong is as efficient as the American commercial product for hookworms and for ascaris. Necators are more sensitive than ankylostomes. The percentage of worms expelled by first treatment is calculated on the method of SCHÜFFNER. Two parallel groups are treated : Group I receives X, followed by A, and Group II A, followed by A or X, where X is the vermifuge being tested and A is a known powerful vermifuge. The author finds it best to give the second cure three days after the first, as the worms are still suffering from the effect of the first dose of anthelmintics and are more susceptible ; and in 3–5 days a considerable production of ova is re-established, showing that the worms are recovering. Enumeration of the ova in a solid mass of faeces " the size of a match-head " is a rough practical guide to the degree of infestation of a group of persons. The single-dose administration of oil of chenopodium is not distinctively more efficient than the divided dose, and is too dangerous for persons not under close observation.

R. T. L.

SCHÜFFNER (W.) & VERVOORT (H.). [In Dutch and English.] **Over de doseering van het Oleum Chenopodii en opmerkingen over de Wormkuur. On the Dosing of the Oleum Chenopodii, and Some Remarks on the Worm Treatment.**—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1921. Pt. 1. pp. 92–109.

It is pointed out that over-dosing with oil of chenopodium has been attributed to the advice of the authors, who state this has occurred because their dosage is based on drops, counted by the International

Drop Counter, giving 40–45 drops per cc., for ethereal oils; whereas in quoting, minim has been substituted for drops, thus giving 17 per cc. The authors' dose is 1·12–1·14 cc., not 3 cc., and with this dose they have had very few cases of poisoning. Reviewing recent work, they conclude that the oil should be fresh, since the active compound ascaridol diminishes, whilst the toxicity of the drug increases on keeping. 1·2 cc. in divided doses, without a preliminary purge and with but slight starvation, is recommended, and the purge afterwards may safely be omitted. This treatment repeated three days later does not cause cumulative effects, though in weak or anaemic patients five days should elapse and Carlsbad water be taken throughout the period. Sclerosis of kidney or liver predisposes to poisoning with oil of chenopodium.

R. T. L.

GONZAGA (Octavio) & GOMES, Junr. (F. Salles). **A proposito do emprego do oleo de chenopodio.** [The Use of Oil of Chenopodium.]—*Bol. Soc. Med. e Cirug. de S. Paulo.* Brazil. 1922. Feb. Vol. 4. 2nd Ser. No. 12. pp. 302–317.

SMILLIE (Wilson) and others. **A proposito do emprego do oleo de chenopodio. (Continuação da discussão do trabalho dos Drs. O. Gonzaga e F. Salles Gomes, Junior.)**—*Ibid.* pp. 338–342.

Gonzaga devotes several pages to recitals of fatalities after the use of this drug since 1851. Some of them could be accounted for by overdosage, but not all. The chief danger is that the oil is a mixture in which the constituents may be present in varying proportions [in other words, is not standardized]. Further, the preparation deteriorates with age and can be easily adulterated. Finally, many patients appear to possess an idiosyncrasy for the drug, so that there is no reliable determination of dosage.

Dr. Wilson Smillie agreed that oil of chenopodium is poisonous, but stated that other anthelmintics are toxic also. Ascaridol, the active principle of chenopodium, was mentioned as surpassing the crude drug in certainty and safety of action. In Rio the essence of *Chenopodium anthelminticum* is used in preference to *C. ambrosiodes*, which is reported as being three times as toxic.

Dr. Gomes concluded that practically all the difficulties arose from the variability of the product, and that the proportion of ascaridol present varied between such wide limits as 36 and 98 per cent.

H. Harold Scott.

DE ALMEIDA, Junr. (Theophilo). **O chenopodio e sua toxidez.** [The Toxicity of Oil of Chenopodium.]—*Brazil Medico.* 1922. Feb. 4. Year 36. Vol. 1. No. 5. pp. 60–64.

A large number of quotations are given from the experiences of those engaged in the treatment of helminthiasis with this drug. The author concludes that oil of chenopodium, even in the doses in common use, may cause symptoms of poisoning, also that children are more susceptible than are adults, and, finally, that the chloroform which is often prescribed with the drug, and to which the toxic symptoms have been attributed, is not to be held responsible.

H. Harold Scott.

BARNES (Milford E.). **Death following the Administration of Thymol.** —*Jl. Amer. Med. Assoc.* 1922. Sept. 16. Vol. 79. No. 12. pp. 964–965.

During an anti-hookworm campaign in Siam over 82,000 treatments with thymol for tapeworms have been administered, resulting in only two fatalities, detailed reports of which are given. In one case a preliminary purge was not taken and the total quantity of the drug (2·6 gm.) was given in a single dose instead of two doses as was the routine practice; the woman died in three hours. She was subject to fainting attacks, and it is suggested that there was some thyroid or cardiac involvement overlooked by the medical officer. The second death was due to pneumonia nine days after administration of 2 gm. of thymol in divided doses; and it was considered that the absorption of the drug was a contributory cause to the development of pneumonia in tuberculous lungs. The death of a coolie is mentioned as following the administration of alcohol by a planter.

R. T. L.

WHELPLY, Junr. (F. R.). **Some Observations on the Treatment of Secondary Anemia, when caused by Infection with** *Ankylostoma duodenalis* [*sic*].—*China Med. Jl.* 1922. July. Vol. 36. No. 4. p. 301.

During an investigation of efficacy of Blaud's mass in the treatment of secondary anaemia due to ankylostomiasis it was found that the anaemia was accompanied by a diminution of erythrocytes, and this led to a trial of Fowler's solution, but the author does not feel justified in drawing any conclusion at present.

R. T. L.

TREMATODES.

CORT (William W.). **A Study of the Escape of Cercariae from their Snail Hosts.**—*Jl. of Parasit.* 1922. June. Vol. 8. No. 4. pp. 177–184.

FAUST (Ernest Carroll). **The Present State of the Schistosome Problem.**—*China Med. Jl.* 1921. Sept. Vol. 35. No. 5. pp. 405–410.

FAUST (Ernest Carroll). **Notes on South African Larval Trematodes.**—*Jl. Parasit.* 1921. Sept. Vol. 8. No. 1. pp. 11–21. With 1 plate & 1 text fig.

KANTER (Helmuth). **Die Verbreitung der im Menschen parasitierenden Trematoden.**—*Janus.* 1921. May–June. Vol. 25. No. 3. pp. 129–190. With 7 maps.

MILTON (Frank). **The Geographical Distribution of Human Schistosomiasis.**—*Jl. Trop. Med & Hyg.* 1922. Sept. 15. Vol. 25. No. 18. pp. 289–292.

VAN THIEL (P. H.). **Aanteekeningen over** *Agamodistomum anophelis.*—*Tijdschr. v. Vergelijkende Geneesk. enz.* 1922. Aug. 5. Vol. 7. No. 4. pp. 305–318. With 1 plate. [French & English Summaries pp. 318–321.]

TYAU (E. S.). **The Treatment of Asiatic Schistosomiasis.**—*Nat. Med. Jl. China.* 1922. June. Vol. 8. No. 2. pp. 83–85.

CESTODES.

FAIRLEY (K. Douglas). **Peritoneal Echinococcosis, An Analysis of Twenty-five Cases.**—*Med. Jl. Australia.* 1922. Aug. 19. 9th Year. Vol. 2. No. 8. pp. 209–215.

MEI (A.). **[Echinococcus Disease in Cyrenaica.]**—*Arch. Italiano di Chirurgia.* Bologna. 1921. Oct. Vol. 31. No. 10. p. 455. [Summarized in *Jl. Amer. Med. Assoc.* 1922. Mar. 4. Vol. 78. No. 9. p. 690.]

NEMATODES.

CONNAL (A.) & CONNAL (S. L. M.). **The Development of** *Loa loa* **in Chrysops.** [Abstract.]—*Brit. Med. Jl.* 1922. Oct. 21. pp. 730–731.

FÜLLEBORN. **Ueber Infektionsversuche mit Toxascaris.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 2. pp. 59–60.

DE GIRONCOLI (Franco). **Ascaridi lumbricoidi in un' ernia crurale strozzata.**—*Riforma Med.* 1922. Jan. 30. Vol. 38. No. 5. pp. 102–104.

NEMATODES—*continued.*

HARNETT (W. L.). **A Case of *Oxyuris vermicularis* in the Vermiform Appendix.**—*Indian Med. Gaz.* 1922. Nov. Vol. 57. No. 11. pp. 419–420.

INDIAN JOURNAL OF MEDICAL RESEARCH. 1922. Oct. Vol. 10. No. 2. pp. 295–342. With 3 maps.—**Distribution and Control of Hookworm Disease in India.** Prepared by the International Health Board, Rockefeller Foundation, New York, U.S.A.

INGRAM (A.). **Perforation of the Ileum probably caused by *Ascaris lumbricoides.*** —*Jl. Trop. Med. & Hyg.* 1922. July 1. Vol. 25. No. 13. pp. 211–212. With 1 text fig.

JAPHA (Alfred). **Hauterkrankung nach einer Kur gegen Oxyuren.**—*Deut. Med. Woch.* 1922. July 14. Vol. 48. No. 28. p. 942.

JIMBO (Kotaro). [**On the Geographical Distribution of** *Oxyuris vermicularis.*] —*Nihon Shyokakibyo Gakkwai Zasshi* (*Japan Jl. of Gastro-Enterology*). 1922. Mar. Vol. 21. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 261.]

LANZ (O.). **Abscess from Ascarids.**—*Nederl. Tijdschr. v. Geneesk.* 1921. May 28. 65 year (1st half). No. 22. p. 2943.

LECLERC (Henri). **La phytothérapie vermifuge : les ascaricides.**—*Presse Méd.* 1921. Aug. 10. No. 64. pp. 1149–1151.

LEFEBVRE (Ch.) & BAILLAT. **A propos des complications chirurgicales de l'ascaridiose (accidents post-opératoires).**—*Presse Méd.* 1922. July 19. Vol. 30. No. 57. pp. 612–613.

PATTERSON (Harold A.). **Experiences with Hookworm.**—*Milit. Surgeon.* 1922. May. Vol. 50. No. 5. pp. 562–569.

RICE (D. A.) & WILLIAMS (H. O.) with a Laboratory Note by SLADDEN (A. F.). **An Outbreak of Trichiniasis.**—*Lancet.* 1922. Oct. 14. pp. 799–801.

TOURNIER (E.). **Un cas de tumeur à *Filaria volvulus* simulant un kyste synovial de la région du poignet, à Anécho (Togo).**—*Bull Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 499–500.

VEIT (R.). **Ein Fall von Askaridiasis der Leber.**—*Muench. Med. Woch.* 1922. Aug. 18. Vol. 69. No. 33. p. 1219.

WALLACE (M. E.). **Hookworms.**—*China Med. Jl.* 1922. Jan. Vol. 36 No. 1. pp. 71–73.

NOTICE.

THE LATE NORTH PERSIAN FORCES.

We have been asked by the War Office to announce the institution of a Memorial Trust Fund, commemorative of the services of the late North Persian Forces, which has been subscribed by Officers of the Royal Army Medical Corps and Indian Medical Service who served with these Forces.

In accordance with the desire of the subscribers to encourage the study of Tropical Medicine and Tropical Hygiene it has been decided that the Memorial should take the form of a silver medal, to be known as the "North Persian Forces Memorial Medal," to be awarded annually for the best paper on Tropical Medicine or Tropical Hygiene published in any Journal during the twelve months ending 31st December by any Medical Officer, of under twelve years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service.

The first award will be for the best paper published during the twelve months preceding 31st December 1923.

The award will be announced in the latter part of the year following that in which the paper was published, provided that the Memorial Committee consider the papers published to have attained a standard of merit justifying an award.

REVIEWS AND NOTICES.

BRUMPT (E.) [Membre de l'Académie de Médecine, Professeur à la Faculté de Médecine de Paris, Secrétaire général de l'Institut de Médecine coloniale.] **Précis de Parasitologie.** 3rd edition, entirely revised. xv + 1,216 pp. With 736 figs. in text and 5 plates. 1922. Paris: Masson et Cie., 120, Boulevard Saint-Germain. [Price 50 francs.]

Though this new edition of Brumpt's well-known Précis has been revised and refreshed (to the extent of 200 pages) with new matter, its bulk is hardly increased and its quality and proportion are unchanged. The author still adheres to the plan of concentrating powerfully on the individual parasites—their morphology, biology, pathogeny, and pathological effects on man—and, while ever giving vigilant attention to practical ends like prophylaxis, clinical diagnosis, treatment, etc., of keeping all these things in proper subordination to the main theme; so that in its new edition the book maintains its reputation as one of the most concise and trustworthy textbooks to which the student of the subject can be referred.

To say that from the standpoint of the medical profession this book—speaking for the present of its first 950 pages, which include all the parasitic animals—is all that can be desired is not to deny that the exacting eye of the zoologist, and even more the fastidious eye of the specialist in some particular animal group, may descry some spots in it. To the zoologist the dichotomy of Metazoa into Zoophytes having a radiate arrangement and Artiozoa having bilateral symmetry, the definition of Protozoa as "unicellular beings capable of movement during part of their existence," and the unquestioned inclusion of spirochaetes in the animal kingdom, will appear blots of unhappy superfluity. The protozoologist will probably object to a somewhat arbitrary application of specific and generic names, to the unqualified association of Blastocystis with Flagellata, and to a proscenium that permits Haemoproteus and Leucocytozoon to appear on the stage but keeps Proteosoma behind the curtain, or that, admitting Haemoproteus, leaves unspoken its principal speech relating to MACCALLUM's discovery of the significance of exflagellation. The Helminthologist will wonder why leeches are interpolated between flatworms and roundworms, or indeed what they are doing in that gallery at all. The Entomologist may complain of some of the unnecessarily-complicated taxonomic tables, especially the one for distinguishing anopheline genera; and although he will not have anything to say—except on the score of unnecessary inconvenience—against treating blood-sucking lice as Rhynchota, he will object with reason to the unnatural inclusion of fleas in the Dipterous order.

The practical needs of the parasitologist, however, are not at every point those of the zoologist, and a little weakness in some of the zoological articulations does not in the reviewer's opinion—and others whose judgment in such matters cries in the top of his—affect the solid value and great practical utility of this admirable Précis.

A. Alcock.

Troisième partie. Étude systématique des Végétaux parasites (à l'exclusion des Bactéries) et des Mycoses ou maladies qu'ils occasionnent. pp. 951–1182.

In the new edition of BRUMPT's text-book the section dealing with the human mycoses occupies nearly one-fifth of the whole. The diseases are grouped according to the organisms causing them, and the latter are fully described.

In his systematic arrangement of the Imperfect Fungi the author, like most French parasitologists, follows the terminology of VUILLEMIN.

The asexual forms of reproduction, other than spores developed in special receptacles, such as pycnidia, are grouped in four categories—conidia, thallospores, hemispores, and aleuria—and the Hyphomycetes are classified according to these spore types and their sub-divisions.

It is unfortunate, from one point of view, that this classification, which is not followed by many French mycologists and has made no way in any other country, should have been adopted. The ordinary systematic mycologist desirous of becoming acquainted with the work on human parasites of the French specialists who are the acknowledged leaders in this field, finds himself in a new world, using a mycological language which he cannot understand. All his standard text books and guides have to be cast aside, and he is forced to learn a new classification in which the Arthrosporae have to be distinguished from the Blastosporae and the Sporophorae from the Phialidae. Even in the sections dealing with pathogenic Phycomycètes, Ascomycetes, etc., the generic names to which one is accustomed are replaced by other, less usual ones. *Actinomyces* becomes, not *Nocardia*, which has found a somewhat wide acceptance in France, but *Discomyces*. The ascigerous form of *Sterigmatocystis* is *Diplostephanus* as distinct from the *Eurotium* of *Aspergillus*; *Mucor corymbifer* is *Lichtheima corymbifera*; *Penicillium brevicaule* is *Scopulariopsis brevicaulis*, and so on. Setting aside the very open question of the validity of these changes, one may be permitted to doubt their expediency, since they have not yet been accepted by the general body of systematists.

These criticisms apart, and after all they concern only one mycologist, who regrets the ever-widening gap between the pure science and its application to the study of a great group of human afflictions, the book gives perhaps the best account of the mycoses as a whole that has yet appeared. The descriptions are admirably clear and concise, the illustrations well selected and beautifully reproduced. The work is thoroughly up to date, some mycoses described as late as the middle of 1922 being included, as, for instance, the Sporotrichosis due to *S. Carougeaui*. This, by the way, is the only species retained in the genus *Sporotrichum*, the rest following *S. Beurmanni* to the genus *Rhinocladium*. The view of Davis (*University of Wisconsin Studies in Science*, 2, pp. 104–130, 1921) that probably all the Sporotrichoses, and certainly the common European and North American forms, are due to a single fungus, *S. Schenckii*, is not mentioned, though the evidence advanced by him appears to be conclusive.

Special attention is called to the frequent indications of a saprophytic life of the fungi parasitic on man. The readiness with which many of them can be grown on various artificial media, the known occurrence as saprophytes in nature of species of *Aspergillus*, *Penicillium*, *Hemispora*, *Rhinocladium*, etc., that can cause mycoses, and the probability of a similar origin of some Actinomycetic infections are all evidences of this.

E. J. Butler.

Spittel (R. L.) [F.R.C.S.(Eng.). Surgeon, General Hospital, Colombo; General Officer in charge of Venereal Clinic, General Hospital, Colombo; Lecturer in Clinical Surgery, Ceylon Medical College.] **Framboesia Tropica (Parangi of Ceylon).**—pp. iv + 59. With 39 text figs. 1923. London: Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, W.C.2. [Price 5*s*. net.]

The author claims this monograph " to be nothing more than a clinical study of framboesia as met with in Ceylon." It is, however, one of the best clinical accounts of yaws yet published. The descriptive text is so well balanced and the photographic illustrations so excellent that the reader cannot fail to obtain a real picture of the disease, a thing not always obtained from textbook descriptions. The author is enthusiastic in his attacks upon those who still waver over accepting the separate entities of framboesia and syphilis, and at the same time does not hesitate to assert a framboesial pathogeny for the bone and joint lesions, gummata of soft parts, etc., which have been rather tentatively described under yaws, or to include juxta-articular nodules, gangosa, and what from the photograph would appear to be the localized leucoderma described by ZIEMANN in West Africa under the name "Melung."

The reviewer has been particularly struck thoughout by the fact that the disease framboesia as described in Ceylon is identical with this disease studied in Africa some fifteen years ago in every detail. As the author observes, "the disease breeds true," and clinically there should be never any difficulty in making a differential diagnosis between yaws and syphilis.

At the same time we are confronted with the fact that on the one hand it is practically impossible to distinguish the two specific spirochaetes from one another, or the two diseases by means of complement deviation tests, and on the other hand that the causal parasite has not been demonstrated in many of the lesions ascribed to framboesia. These are points which deserve the attention of the tropical pathologist, as not until these problems have been more fully investigated will the subject of yaws be established on an unassailable basis.

Attention is drawn by Dr. Spittel to the local distribution of yaws among scattered forest settlements rather than among town-dwelling populations, a fact which accounts for cases being overlooked and the geographical distribution of framboesia curtailed. The part played by flies in spreading infection by contamination is emphasized. The descriptions of the several eruptions, besides that which gives the disease its name, are very good, and it is interesting to note that this observer in Ceylon failed to see any lesions of mucous membranes. The same experience fell to the lot of the reviewer in Africa and he remains a little sceptical of their occurrence though mentioned in text-books. The author in speaking of the distribution of the framboesiform nodules mentions the "predilection for the flexures such as the axilla," thus rightly correcting a contrary statement which had crept into some books.

There is a full account of the so-called tertiary affections, gummatous nodules, bony changes and ulcerations, and as above mentioned, the conditions known as gangosa and juxta-articular nodules. With regard to the nervous system in framboesia the author preserves a non-committal attitude, such symptoms as he has observed being those rather of a transient toxic effect than of any organic lesion. At the same time he says, "It is highly probable that the nervous system is slightly touched at one stage of parangi. The disease bears too close a resemblance to syphilis for this not to be so," and brings as further evidence in favour of this rather unsatisfactory statement the results of the examination of the cerebro-spinal fluid in nine cases of secondary and five cases of tertiary yaws. "All the former gave negative Wassermann reactions except one, which gave a very weak positive to a provocative test; but two of the tertiary cases gave weak positive reactions. No globulin increase or pleocytosis has yet been observed." Results which will scarcely impress the reader.

Treatment is dealt with fully and a word of warning is uttered about expecting too much from one or two salvarsan injections. The immediate results are often nothing short of miraculous and the delighted patient is liable to take himself off, but we know that, in some such cases at all events, recrudescence occurs, and probably much work and careful record-keeping will be necessary before an assured method of treatment is established.

Hugh S. Stannus.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 4.

MEDICAL ENTOMOLOGY: A RETROSPECT.

By Lt.-Col. A. ALCOCK, C.I.E., M.B., LL.D., F.R.S., I.M.S. (retd.).
Assistant Director, Tropical Diseases Bureau.

Since the publication of the first Review of the progress of Medical Zoology in this *Bulletin* [ALCOCK (1921)], 265 papers relating to Medical Entomology have been noticed in these pages. If some of these papers have not originated in any observations made in the tropics, the explanation is that medical zoology, as represented in this *Bulletin*, must look everywhere for facts possible of further elucidation and principles capable of application in tropical countries, and also for ideas—such as those evoked by CRAGG's (1920 *a*) remarkable observations on the behaviour of the spermatozoa of the bed-bug—abounding in general biological and pathological significance.

In this present Retrospect from December, 1922, back to July, 1921, such of those papers, already noticed here, as appear to be of more than ordinary importance are reconsidered from a larger point of view —along with some ancient history of the Linguatulida which it seems opportune, now that these parasites are coming so much under observation in tropical Africa, to resuscitate.

Intrinsic Character of the Water as a Possible Influence on the Breeding of Anopheles.—Every one now knows that, though some species are more fastidious than others, particular species of Anopheles have particular preferences in the matter of breeding-places—that the larvae of a given species are not found indiscriminately in water of any and every kind. There has undoubtedly been an impression that the choice of aquatic habitat is governed by the obvious features of the environment, although many years ago that penetrating observer Malcolm WATSON suspected that it might be influenced in subtler ways by the composition or character of the water itself. In the latest edition of his book, " The Prevention of Malaria," (1921), WATSON quotes his early speculations on this subject and his anticipations of a time when, in the fullness of knowledge, malaria might be abolished at small expense by biological methods and elaborate drainage schemes might become obsolete. Recent researches by LAMBORN (1922) in Malaya, although, unfortunately, they were not completed, tend on the whole to support one aspect of WATSON's theory. LAMBORN by no means confines his attention to a single species, but he has selected a common species, *Anopheles aconitus*, for continued observation, and he has observed that in a cluster of ponds in the same tract, apparently differing *inter se* only in such a purely intrinsic feature as the relative amount of floating water-weed, the larvae of *A. aconitus* may be predominant above all other species in some ponds and be unrepresented among the larvae collected in other ponds. This accomplished observer concludes, with regard to *A. aconitus* at least, that its distribution is affected by some quality of the water—some quality which either directly or indirectly influences the food-supply. He does not say much about the composition of the aquatic flora of the ponds; but it is known (METZ (1919), and CABALLERO (1919)) that certain common kinds of water-weed do exercise an adverse influence on certain mosquito larvae under experimental conditions; and CABALLERO (1920), who has carried his observations into Nature, is satisfied that there are three species of algae of the cosmopolitan genus Chara which under natural conditions also are in some way—possibly indirect—inhibitive to mosquito larvae. Observations by MACGREGOR (1921) also, on the influence of the hydrogen-ion concentration in the development of mosquito larvae, have another bearing on this question.

Unusual Breeding-places for Mosquitoes.—It is common knowledge that certain species, both of anophelines and culicines, breed exclusively in trees, but HAWORTH (1922), in East Africa, has found larvae of *Anopheles costalis,* along with *Culex fatigans, Stegomyia fasciata,* and other species, in the tops of coconut palms. This is not an isolated phenomenon; in the course of about six months in each township 2,889 palms in Tanga yielded 1,418 collections of larvae, and 1,673 palms in Dar-es-Salaam 1,549 collections, the totality of observations comprising a whole year and thus including the dry season.

Length of Life and Duration of Malarial Infection in Anopheles.—Bruce MAYNE (1922) has incidentally confirmed the well-enough-known fact that some species of Anopheles can live for several months; but in working with *A. punctipennis* he found that individual insects infected with the malaria parasite could be actually infective to man 55 days, and could retain active sporozoites in the salivary glands 70 days, after the original infective repast.

The Protective Influence of Domestic Animals against Malaria.—The fact that in the most politic and prosperous parts of Western Europe malaria, once so prevalent, practically disappeared long before any exact knowledge of its causation and prevention had been gained, while the Anopheles capable of maintaining the infection remain to this day, has impressed many people. Most people would be content to regard this impotence of the local Anopheles as one of the many ulterior consequences of western civilization—as a side issue of the disciplined industry that results in the subjugation of the powers of the jungle. ROUBAUD (1921 *a*) (1922), however, sees in the modern management of domestic cattle the one circumstance that has freed Western Europe from malaria. According to him the Anopheles here have turned their attention exclusively to conveniently congregated cattle, which they much prefer to man, and so have abandoned their indispensable place in the malaria connexion. So far has this adaptation to cattle gone that structural modifications in the insects' maxillae are said to have occurred. Dissent from this special pleading does not imply ignorance of the fact that one of the commonest European species of Anopheles congregates in cattle sheds and stables in cool weather and can then, if necessary, be destroyed in large numbers. But the theory itself reminds one of that theory of BUCKLE's which attributed all the distress of Ireland to the introduction of the potato.

Destruction of Larvae of Stegomyia fasciata.—The stocking of domestic water-vessels with small fish has proved a most efficient method in the experience of the Rockefeller Yellow Fever Commissions in Central and South America [ROCKEFELLER FOUNDATION (1922)]. CONNOR (1920) also describes the success of this method in Guayaquil. MACFIE (1921) finds that sea-water is sufficiently destructive to larvae of *Stegomyia fasciata*, and is of opinion that it might be used, where available, for this purpose in municipal flushing operations.

Phlebotomus and Oriental Sore, etc.—Though recent experiments have much strengthened the hypothesis that Phlebotomus transmits the parasite of Oriental sore, they still fall short of conclusive proof that this insect is either its necessary intermediary or the prime natural source of infection. The latest work of the brothers SERGENT (1921) and their collaborators in N. Africa, and of ARAGÃO (1922) in Brazil, proves that Phlebotomus taken from a focus of infection (or from an actual case) may be infective when crushed and inoculated within three or four days ; but, as WENYON remarks, it is probable that the same result could be obtained with crushed bed-bugs if they were used at so short an interval after ingesting the parasite.

It is pertinent to draw attention to PRINGAULT's discovery (1921) of spirochaetes in the gut of *Phlebotomus perniciosus.*

LARROUSSE's memoir (1921) on Phlebotomus and the compendious, though rather abstrusely technical, papers of FRANÇA (1919) and FRANÇA and PARROT (1920) must again be mentioned, though a monograph of this genus, based on extensive collections from all parts of the world, is still a desideratum.

Simulium and Pellagra.—This theory " has apparently died a natural death," and regular readers of this *Bulletin*, at any rate, need hardly be reminded of BIGLAND's (1922) erudite review of the literature of pellagra, where the conjectured aetiological factors are appraised ; though rash entomologists who have affirmed the Simulium theory to be proved may benefit by study of it.

Chrysops and Loaiasis.—Nearly thirty years ago MANSON surmised that *Chrysops dimidiata* was the intermediary host of *Loa loa*, a surmise that was subsequently justified by the observations of LEIPER and of KLEINE. The development of the worm in *Chrysops silacea* and *dimidiata* has now been carefully investigated and fully described by the CONNALS (1921). Although most of the embryos escape from their sheath within a few hours of ingestion, some may remain ensheathed, and alive and active in the stomach of the fly, for as long as three days ; hence in course of time there is considerable disparity in the size of the developing forms. Usually, however, most of the embryos have freed themselves and made their way through the stomach-wall of their nurse in about six hours. Preferably they settle, to begin with, in the abdomen of the fly, where they greatly increase in breadth. In the course of the third day the alimentary canal is complete ; a simple mouth is formed, and the anus opens out of a subterminal vesicle. On the sixth day the larva moults, piecemeal, and the tail-end becomes trilobed. From this time onwards there is rapid increase in length. On the seventh day the larvae are very freely locomotive ; they may be found far down the legs of their host, and in the halteres and the root of the wings, but most of them tend towards the head, where on the tenth day they are found congregated about the root of the proboscis, ready for migration to their final host. In their passage from the fly they travel rapidly down the labium and escape between the labella. Several hundreds have been observed to leave a single fly. When a heavily infected fly is feeding the larvae may be seen passing on to the victim's skin in a continuous glistening stream ; the fly is sometimes disquieted by such a flood of larvae, and may brush them off and flick them about with its front legs. No suggestion of pairing-off of migrating larvae was observed. No satisfactory answer can be given to the question of the duration of infectivity of the fly, as the flies were all captives under experiment ; none of these lived more than fourteen days after becoming infected.

MARCHAND's memoir (1920) on the early stages of Tabanidae must again be brought to general notice.

The Problem of Tsetse-fly Control.—In a noteworthy paper on Tsetse-flies and Trypanosomiasis in French West Africa, ROUBAUD (1920) stigmatizes *G. palpalis* as the species above all others that has proclivities for man, and signalizes *G. morsitans* as the species most exclusively restricted to game. Attracted by the observation that certain breeds of domestic animals—notably the small N'dama cattle and the Malinké and other N'dama derived breeds—are refractory to trypanosomiasis, and that the integuments of the dwarf Fouta goat are impervious to the fly, he thinks that such animals could be installed as screens to villages. In contrast with this seductive indirect method, DAWE (1922) robustly proposes extensive cultivation of Eftwatakala (*Melinis minutiflora*), a grass said to be offensive and destructive to insects by its smell and stickiness. SWYNNERTON (1921), in a paper distinguished alike for breadth of view and careful attention to detail, appears at present to have most confidence in properly planned and directed, periodic, clearing and burning. One item of SWYNNERTON's historical survey deserves to be widely propagated ; it tells how a stubborn Zulu chief unwittingly expelled *G. morsitans*, and probably some other species, from a tract of jungle without any special attack on its game. This chief, in defiance of fly, settled his tribe, cattle and all, in a fly-belt. The belt being soon cleared and put under cultivation became free of fly and safe for cattle ; it also became scarce of game, and to this fact the people attributed the disappearance of fly. But—and this is the interesting point—the fly also disappeared from a tract of chiefly deciduous, game-tenanted jungle beyond the reclaimed belt, so that it too became quite safe for cattle—a comforting illustration of the old truth that " our indiscretions sometimes serve us well, when our deep plots do pall," and also a parallel to the unpremeditated course of events by which, in England, Anopheles was quietly pushed into the background. It also justifies FISKE's (1920) argument that the likeliest way of getting rid of *G. palpalis* in troublesome areas is to promote the industries by which the local populations grow strong and multiply and at last become victorious over the jungle. So well satisfied does FISKE seem to be with this argument that a considerable part of his Uganda Fly Report for 1920 is devoted to an economic study of the local fisheries and fuel industries.

If a simple Zulu chief could get tsetse-fly out of a tract of virgin jungle without thought or intention, is it not possible that in the irony of Nature a clever plan to starve out the fly merely by destroying its natural hosts may have ulterior consequences quite as unsuspected ? An answer to this question is suggested by another undesigned experiment, made in England, and related by the Hon. Gerald LASCELLES in his " Thirty-five Years in the New Forest." The author tells how the commoners persistently objected to the wild deer of the forest, which consumed the pasture of their cattle, and how at last the offending deer were removed by Act of Parliament. But " instead of the pasture being increased by the removal of the deer, the contrary was the case. The deer had been invaluable in keeping down the . . . rough undergrowth, which, after their removal, began to encroach on the lawns, where alone the best pasturage grows." So that " there is less pasturage in the open forest now, when 6,000 deer have been taken off it, than there was when they were alive and grazing alongside the cattle." One can hardly find a better lesson on the danger of being too suddenly familiar with Nature.

Muscaria.—The term of life of the house-fly (*Musca domestica*), under normal conditions of sexual activity, has been much debated and is commonly believed to be about six weeks, but ROUBAUD (1921 *b*) finds that if the food contains nitrogen the insect can live nearly twice as long, and KOBAYASHI's (1921) Corean house-flies fed on moistened biscuit were kept alive for 101 to 120 days, the females sometimes depositing eggs.

The carefully reported observations of BISHOP and LAAKE (1921) show that common flies can make much longer flights than is commonly supposed, and that when set free in the open they do not always settle at the first apparently suitable spot. The longest distance travelled by *Musca domestica* in these observations was over 13 miles, and this distance was exceeded by two miles by the screw-worm fly (*Cochliomyia macellaria*).

The question whether maggots that have fed on matter infected with pathogenetic organisms can retain the infection until they issue in the adult stage has been fully discussed in GRAHAM-SMITH's " Non-Bloodsucking Flies," where it is concluded that although the maggot itself may not remain infected, yet if when it pupates the surface of the puparium remain in contact with the infected material the presently emerging fly may become infected from inevitable contact with the puparium. This conclusion has lately been confirmed by WOLLMAN (1921), who finds that if a maggot be fed with bacilli (typhosus, dysentericus, tuberculosis, and anthracis), bacilli can be recovered from the pupa, but not from the issuing fly if the surface of the puparium be sterilized. Since maggots do not as a rule pupate in their pabulum, the possibility of flies becoming infected from pathogenetic organisms in the pabulum of the larvae is, as TEBBUTT (quoted by GRAHAM-SMITH) had concluded, very remote.

Geographical Distribution of Rat-fleas in Relation to the Epidemiology of Plague in India.—CRAGG's (1920 *b*) laborious work on the species of Xenopsylla parasitic on Indian rats and on the geographical distribution of these species as a possible factor in the epidemiology of plague in India (1921) deserves further investigation. There are, as is well known, certain parts of India to which, in recent history, plague has never penetrated, or which it may have occasionally reached but without epidemic consequences. So long as all the flea-parasites of the ubiquitous rat were assumed to be *Xenopsylla cheopis* —a notoriously dangerous character—this remarkable phenomenon was " wrapped in mystery." CRAGG, however, finds that although in the *general* census *X. cheopis* is the predominant species, yet there are two other Indian rat-fleas—*X. astia* and *X. brasiliensis*—of which the former is the predominant and sometimes very greatly predominant rat parasite in *particular* localities. He finds, furthermore—so far as he can judge from collections of rat-fleas that have come into his hands —some suggestive correspondences between the localities where the predominant rat-flea is *X. astia* and the localities that have never been stricken (or heavily stricken) with plague; and he is thus led to infer, what can only be conclusively settled by investigation of the reaction of this particular species to the plague bacillus, that *X. astia* may be an innocent flea.

It may be mentioned that, as regards the male sex, *X. brasiliensis* can easily be distinguished from the other two species by the long pedicle of the antepygidial bristle, and *X. astia* from *X. cheopis* by the very different form of the ninth abdominal sternite; and that the females of the three species differ very obviously *inter se* in the shape and size of the spermatheca. All these differences are exhibited in the accompanying figures.

Is the Virus of Typhus Fever heritable by the Louse?—Authorities are not in agreement on this question. SERGENT, FOLEY and VIALETTE (1921) concluded, apparently from having successfully transmitted the disease by inoculating nits taken from a typhus patient, that the infection is transmitted to progeny. NICOLLE, BLANC and CONSEIL, using not nits from an infected parent but young lice hatched from such nits, were not successful in transmitting the disease, and concluded that the infection is not transmitted to progeny. NICOLLE's explanation (1921) of the discrepancy in these results is that the nits used in the Sergent experiments must have become contaminated superficially by contact with the infective faeces of the parent. Judging by analogy with WOLLMAN's experiments comparing infected with superficially-sterilized house-fly puparia, NICOLLE's explanation seems reasonable; at any rate he holds to his experimental conclusion.

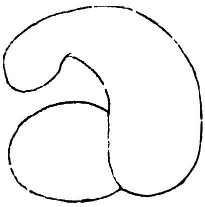
Insect Flagellates.—In a former retrospect [ALCOCK (1921)] reference was made to the discordance between the results obtained by HOARE and those obtained by authors who hold that the leishmaniases of vertebrate animals are vicarious herpetomoniases of insects. This discordance has now been expressed by BUCHNER (1922), who failed to verify the results reported by LAVERAN and FRANCHINI on repeating those observers' experiments of injecting the flagellates inhabiting the gut of the sheep-ked into white mice. HOARE (1922) also has confirmed NÖLLER's account of the crithidia of the ked as the antecedent form of the trypanosome of the sheep—a trypanosome which, according to HOARE, is not pathogenetic to the sheep in ordinary circumstances. It appears from HOARE's observations that the sheep is infected not by the bite of the ked, but in some other way.

Tick-borne Diseases.—Experiments conducted by BATES, DUNN, and ST. JOHN (1921) have proved *Ornithodorus talaje* to be the intermediary infective agent of relapsing fever in Panama. Patients suffering from the disease gave an account of having been badly bitten by ticks two or three weeks before admission to hospital; *O. talaje* was discovered in the huts where the patients had slept at that time; and from these ticks the disease was communicated experimentally, first to rats and to human beings, and thence subsequently to other laboratory animals; spirochaetes indistinguishable from the human type were also found in the coelom-fluid of the ticks.

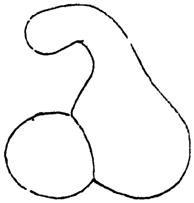
HAROLD (1922) gives circumstantial evidence tending to inculpate *Ornithodorus lahorensis* as a carrier of relapsing fever in Persia.

Attention is certainly due once more to two interesting and suggestive papers by MEGAW (1921). One of these deals with a typhus-like fever, often mistaken for some form of paratyphoid, which occurs in Kumaon and neighbouring foot-hills of the north-west Himalayas. MEGAW more than suspects that this fever is communicated to man by ticks of some sort, and provisionally he classifies it along with Rocky

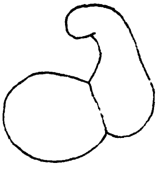
DIAGNOSTIC CHARACTERS OF SOME XENOPSYLLA RAT-FLEAS



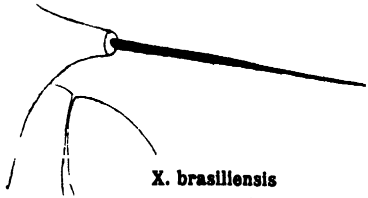
X. cheopis spermatheca



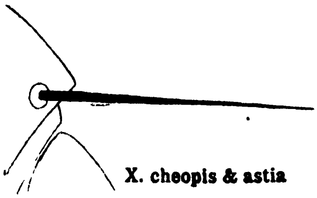
X. astia spermatheca



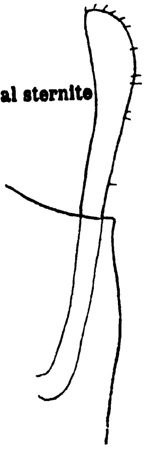
X. brasiliensis spermatheca



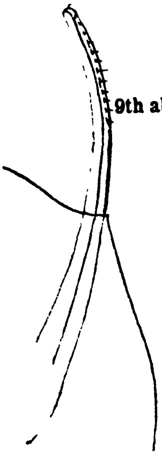
X. brasiliensis
antepygidial bristle on long pedicle



X. cheopis & astia
antepygidial bristle on tubercle



X. cheopis



X. astia

Mountain Fever in one of three sections of a typhus-group of diseases of which the other two sections are respectively exemplified by louse-borne typhus and tsutsugamushi disease.

In the other paper MEGAW suggests that a twelve-day fever recently reported from Nigeria may also find a place among tick-borne or mite-borne fevers of the typhus group.

Tick-bite Paralysis.—MCCORNACK (1921) has given a useful review of this subject, along with accounts of 11 cases. DODD (1921) records some careful observations of the symptoms and course of this intoxication in animals.

Mite-borne Diseases.—In a comprehensive review of tsutsugamushi disease by KAWAMURA and YAMAGUCHI (1921) there will be found a full account of the *Trombidium akamushi* and its numerous mammalian and avian hosts.

The Linguatulida or Pentastomida.—Infestation with the encysted larval and "nymphal" forms of Linguatulids seems, from recent observations, to be common in certain parts of tropical Africa, especially among tribes who eat snakes. MOUCHET states that he has found them in Leopoldville in over 22 per cent. of his post-mortem investigations. NOC and NOGUE (1919) report a very dreadful and fatal case which at first was suggestive of trypanosomiasis. The same authors (1920) give an account of another fatal case where the symptoms resembled those of chronic nephritis. MONZIOLS, COLLIGNON and ROY (1920) also have described a fatal case of jaundice in which the biliary ducts were stuffed with encysted larvae of a Porocephalid. In Africa the larva most commonly parasitic in man is that of *Armillifer armillatus* (the adult form of which is parasitic in the lung of pythons and big vipers) and the cysts are usually located in the abdominal viscera, particularly the liver and omentum, but sometimes in the lung and other organs. The recent papers of SAMBON (1922) on the classification, distribution and host-incidence of these remarkable Arthropod endoparasites are therefore opportune.

In the catalogue of Linguatulid hosts, SAMBON names five species as having been observed in the larval stage in man, namely *Linguatula serrata* (= *Pentastomum taenioides*), parasitic also in many domestic animals in all regions except Australia ; *Armillifer armillatus*, the adult of which is a parasite of pythons and certain large vipers in Africa ; *Armillifer moniliformis*, occurring as adult in Indian pythons ; *Porocephalus subulifer*, which as an adult is a parasite of certain African snakes ; and (doubtfully) *Porocephalus crotali*, a parasite of rattlesnakes (America).

As it is possible that further investigation may lead to the discovery of other species infesting man in their larval stages, it may perhaps be useful to give a conspectus of SAMBON's classification. For the definitions of the genera included in this author's scheme the original papers must be consulted ; we can here mention only their final hosts, geographical distribution, and striking characters.

SAMBON arranges the Linguatulidae in two subfamilies, namely (1) *Raillietiellinae*, having the uterus sacciform, the female genital-opening at the anterior end of the abdomen, the mouth anterior to the hooks, and the salivary glands (which are easily visible in a fixed and cleared specimen) moderately developed ; and (2) *Porocephalinae*, having a greatly-elongate, coiled, tubular uterus, the female genital-opening at the posterior end of the body, the mouth in line with or posterior to the hooks, and the salivary glands extending the whole length of the body.

The only criticism that must be made here is that since the oldest genus in the subfamily " Porocephalinae " is *Linguatula,* Fröhlich (1789), the subfamily name should be Linguatulinae, not Porocephalinae.

In the subfamily Raillietiellinae two genera are included—*Raillietiella* and *Reighardia,* the species in both being worm-like in form and of moderate or small size, and having the mouth anterior to the hooks, which are arranged in a trapezoid.

The species of Raillietiella have the end of the tail bifid, are found, according to SAMBON, in all the great regions of the globe except Australia, and have as hosts in their adult stage various species of snakes, lizards and a toad.

The single species of Reighardia has the tip of the tail rounded, and in its adult stage is a parasite of several wide-ranging gulls and a wide-ranging tern.

SAMBON arranges the subfamily Linguatulinae (or, as he calls it, Porocephalinae) in three sections, namely Sebekini, Porocephalini, and Linguatulini ; in the first two the body is worm-like, in the last it is more or less flattened and fluke-like.

(*a*) In the Sebekini there is a lateral line (latero-ventral groove) on either side of the body, the hooks are arranged in a trapezoid, and the alimentary canal (which is plainly visible in a cleared specimen) is sinuous. In this section the following five genera are included by SAMBON :—

Sebekia, Sambon : worm-like species of small size (with one exception not more than an inch in length, and often smaller), characterized by their small hooks with the convexity *serrated* ; found in crocodiles, alligator, caiman and gharial.

Leiperia, Sambon : worm-like, with the posterior moiety of the body coiled in a spiral, of large size ; a single species, in the Nile crocodile.

Sambonia, Noc and Giglioli : in Varanid lizards. *Diesingia,* Sambon, in the Indian Kachuga (freshwater tortoise). *Alofia,* Giglioli : of which the unknown hosts are conjectured by SAMBON to be fishes.

(*b*) In the Porocephalini there is not a lateral line, the hooks are arranged in an open curve, and the alimentary canal is straight. The species included in this section are worm-like parasites of snakes, and the females attain a length of several inches ; SAMBON recognizes four genera, namely :—

Porocephalus, Humboldt : the hosts of the adults are American Crotalines, the boa constrictor, and certain African snakes ; the constrictions between the annuli are not, or only slightly, marked, and the posterior end of the body is almost bulbous.

Kiricephalus, Sambon : the snake hosts occur in the oriental region and in America ; the anterior end of the body is knobbed like a Kaffir " Kiri," the worm-like body has a spiral twist.

Waddycephalus, Sambon : one species, in Australian snakes ; the worm-like body tapers posteriorly, and the tip of the tail is bilobed.

Armillifer, Sambon: the snake hosts are oriental and African; the constrictions between the individual annuli are very strongly marked, giving the body a characteristically chain-like or moniliform appearance.

(*c*) In the Linguatulini the form of the body is more or less fluke-like or spatulate. This section is constituted of two genera, namely:—

Linguatula, Fröhlich: parasitic in many mammals, both wild and domestic, in all regions of the globe except Australia.

Subtriquetra, Sambon: body, though more or less elliptical and flattened ventrally, strongly convex dorsally; parasitic in caiman and Indian crocodile.

As SAMBON remarks, the taxonomic position of the entire group of Linguatulida was long a puzzle.

As a matter of fact their place in Nature was for about 50 years after their first discovery entirely misconceived. They were included among the intestinal worms; not because of their life-history, for that was unknown, but merely at first from their superficial appearance and endoparasitic habit.

The great landmark in the history of the group is the classical memoir of LEUCKART, who was the first to follow out experimentally the wonderful life-cycle—so much resembling that of a tapeworm—of a Linguatulid. This memoir, which is entitled "Bau und Entwickelungsgeschichte der Pentastomen," and was published at Leipzig and Heidelberg in 1860, contains *inter alia* a very complete account of the gradual elucidation of the nature and true relations of this aberrant group of parasites. It would take us too far from our general purpose to follow all the attractive details of LEUCKART's history, but a short summary of its leading evênts would, we think, be both interesting and in several ways instructive.

LEUCKART tells us that the endoparasites now known as Pentastomida (or Linguatulida) were first brought to notice in 1787 by an eminent French veterinarian named CHABERT. CHABERT discovered in the depths of the nasal cavities of dogs and horses a finger-length "worm," which he took for a tapeworm and called *Taenia lanceolata*.

Two years afterwards ABILGAARD in Denmark and FRÖHLICH in Germany encountered—the former in the body-cavity of a goat, the latter in the lung of a hare—a very much smaller "tapeworm" of the same sort. ABILGAARD called his *Taenia caprina*; FRÖHLICH regarded his as a new genus of Helminths, and named it *Linguatula serrata*. It is FRÖHLICH's name, but in more aristocratic zoological company, that the then misunderstood creature still bears.

Ten years later (1799) the famous HUMBOLDT, in the course of his travels in South America, came upon another puzzling "worm" in the lung of a rattlesnake. At first he classed it as an Echinorhynchus, then as a Distoma, and finally he conceived the new genus *Porocephalus* and named it *Porocephalus crotali*. In quite different zoological associations it is still known by that name.

In 1811 BOSC discovered a "worm" in the lung of a guinea-pig. Regarding it as a new genus and species (though really it was the form already named by FRÖHLICH) he called it *Tetragulus caviae*.

It needed what LEUCKART calls the wonderful RUDOLPHI touch to make out that all the afore-described "worms" formed a single zoological group. But even RUDOLPHI failed to locate the group; taking the mouth and the four hook-pockets for suckers, he eventually placed it, in 1819, under the generic name Pentastomum, among the many-suckered Flukes, between Tristomum and Polystomum.

The genus *Pentastomum* remained either among the Trematodes or among the Nematodes until 1831, when MEHLIS (whose work, unpublished, was made known by NORDMANN) recognized that it was something altogether remote from any of the intestinal worms. But neither MEHLIS nor NORDMANN understood the true relations of Pentastomum, and their immediate successors, who included such redoubtable authorities as OWEN and DIESING, could not get away from the idea that those relations were with the parasitic worms ; the latter, in 1836, placing Pentastomum in a separate order, Acanthotheca, between the Nematodes and Trematodes.

In 1845 DUJARDIN drew attention to the fact that these Acanthotheca differed from every kind of parasitic worm, and approached the Arthropoda, in having striated muscles. And in 1849 the great VAN BENEDEN, on embryonic as on anatomical grounds, put Pentastomum (*i.e.*, the group Linguatulida) in its proper setting (though not in its exact rank) in the phylum Arthropoda.

It was about this time, LEUCKART tells us, that the Linguatulida became interesting as human parasites, and it was from this interest that their life-history seems to have been approached. About 1847 PRUNER had not infrequently observed, in Cairo, and particularly in negroes there, parasites, which he took for nematodes or for insect larvae, encysted in the liver. BILHARZ, however, recognized what they were, and VON SIEBOLD referred to them as a new species of Pentastomum. In 1854 ZENKER stated that a quite different species of Pentastomum was a common parasite of man—usually in the liver—nearer home.

That these human parasites were not sexually developed attracted the attention of more than one observer, and in 1854 GURLT formulated the hypothesis—in analogy with the life-history of some of the helminth parasites of man—that they were developmental stages of Pentastomum. In LEUCKART's memoir the experimental proof of this hypothesis is presented in original detail by LEUCKART himself.

It was LEUCKART, finally, who also traced the Linguatulidae (or, as he calls them, Pentastomidae) to their place in the natural system, as a family connected with the order of Mites (Acarina).

Since LEUCKART's time a good deal of study has been given to the Linguatulida, but the results have not, any more than the earlier work, received quite the attention they deserve in zoology text-books. One of the best, comparatively recent, accounts of the anatomy of the group for English readers is BALDWIN-SPENCER's "Anatomy of *Pentastomum teretiusculum*," in the *Quarterly Journal of Microscopical Science*—1890, Vol. 34, Part 1, pp. 1-73, with 8 plates. SAMBON's well-illustrated papers on classification, specific characters, geographical distribution, and specific host-incidences of the Linguatulida should now provide for the worker far afield the means of adding to our knowledge of a group that is not without importance in tropical pathology.

REFERENCES.*

* References are to summaries in the *Tropical Diseases Bulletin* unless otherwise stated. Dates in parentheses refer to year of publication of original papers.

ALCOCK (1921), xviii, 1–14.
ARAGÃO (1922), xix, 316.
BUCHNER (1922), xix, 822.
BISHOP & LAAKE (1921), xix, 485.
BATES, DUNN & ST. JOHN (1921), xix, 320.
BIGLAND (1922), xix, 451–457.
CRAGG (1920 *a*), xviii, 26.
—— (1920 *b*), xviii, 204.
—— (1921), xix, 490.
CABALLERO (1919), xvii, 116.
—— (1920), xix, 113.
CONNAL (A.) & CONNAL (S. L. M.) (1921), xix, 225.
CONNOR (1920), xix, 112.
DAWE (1922), xix, 836.
DODD (1921), xix, 493.
FISKE (1920), xix, 489.
FRANÇA (1919), xviii, 20.
FRANÇA & PARROT (1920), xviii, 196.
HOARE (1922), xix, 874.
HAROLD (1922), xix, 556.
HAWORTH (1922), xix, 829.
KAWAMURA & YAMAGUCHI (1921), xix, 753.
KOBAYASHI (1921), xix, 115.
LARROUSSE (1921), xviii, 196.
LAMBORN (1922), xix, 831.
MAYNE (1922), xix, 868.
MARCHAND (1920), xviii, 202.
McCORNACK (1921), xix, 119.
MEGAW (1921), xix, 67.
MACGREGOR (1921), xix, 476.
MONZIOLS, COLLIGNON & ROY (1920), xvi, 115.
MACFIE (1921), xix, 482.
METZ (1919), xv, 153.
NOC & NOGUE (1919), *Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain*, i, 6.
—— & —— (1920), *Id.*, ii, 284.
NICOLLE (1921), xx, 37.
PRINGAULT (1921), xviii, 246.
ROUBAUD (1920), *Bull. du Comité d'Etudes Hist. et Sci. de l'Afr. Occid. Française*, No. 4, July–Sept.
—— (1921 *a*), xix, 476.
—— (1921 *b*), xix, 485.
—— (1922), xix, 478.
ROCKEFELLER FOUNDATION (1922), xix, 900.
SAMBON (1922), *Jl. Trop. Med. & Hyg.*, xxv, 188–206 & 389–428.
SWYNNERTON (1921), xviii, 22.
SERGENT (Ed. & Et.) & others (1921), xix, 315.
SERGENT, FOLEY & VIALATTE (1921), xx, 37.
WOLLMAN (1921), xviii, 200.

TROPICAL DERMATOLOGY.

FUSCO (Pietro). **Considerazioni sulle malattie cutanee in Libia: Sifilide—Lepra—Pian.** [Skin Affections in Lybia: Syphilis—Leprosy—Yaws.]—*Arch. Ital. di Sci. Med. Colon.* Tripoli. 1922. Aug. Vol. 3. No. 8. pp. 165–173.

Cutaneous manifestations of syphilis are less often met with than one would expect seeing that, according to the author, the disease may be said to be practically universal among the Arabs. This fact is ascribed to the disease having prevailed for so long a period that a certain degree of immunity has become hereditarily transmitted, and the disease consequently of a mild type. The same is said to hold good as regards Leprosy, though all forms occur. Yaws was first recorded in 1912, and CASONI in 1915 reported ten cases collected in four years. It also is of a mild type.

H. Harold Scott.

CARRIÓN (Arturo L.). **Algunas observaciones sobre las dermatomicosis.** [Observations on the Dermatomycoses.]—*Bull. Porto Rico Med. Assoc.* 1922. Oct. 30. Vol. 16. No. 130. pp. 204–210. With 3 figs.

Accounts of three cases, a youth of 17, a man of 43, and a woman of 48 years, suffering from Tinea cruris. They are recorded because of the sites secondarily affected: the right side of the neck in the first, the abdomen, chest and shoulder in the second, the right side of the face and the right subclavicular region in the third.

H. H. S.

CARNEIRO (A. Lima). **Uma epidemia de tinha produzida pelo** "*Trichophyton Crateriforme,*" **Sab. 1893.** [An Epidemic of Ringworm due to *Trichophyton crateriforme*, Sabouraud, 1893.]—Reprinted from *Med. Contemporanea.* 1922. No. 6. 6 pp. With 6 text figs.

Thirty-seven cases were observed in a school, 24 of the patients being under 16 years of age. They proved very resistant to treatment, icthyol, resorcin, iodine in alcohol, biniodide and bichloride of mercury all being ineffectual.

The organism was grown from four cases. It was an endothrix which the author terms *Trichophyton crateriforme*, Sabouraud, 1893, as "the name most used in medical mycology," but states that it is the same as *T. tonsurans* and *T. megalosporon* endothrix.

H. H. S.

OTA (M.). **Sur deux espèces nouvelles de Dermatophytes en Mandchourie:** *Microsporum ferrugineum* **et** *Trichophyton pedis* **n. sp.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 588–596. With 4 text figs.

The first species here described seems to be the common form in schools in Moukden. Out of 40 pupils 14 were affected with this organism. It causes bald patches on the scalp, and circinate areas on the smooth skin, sometimes, but rarely, vesicular, mostly scaly. Mycelium is readily found in the hair shaft and in scales. Cultures on glucose agar and maltose agar give a rust-coloured downy growth

Drop cultures show forms of growth very like *Microsporum Audouini*, and the parasite is probably a human variety.

The second fungus described produces a dysidrosis of the feet, and grows a culture white on the surface, but showing either a brownish tint or a purple colour when seen through the depth of the medium. The author discusses the question whether it should be regarded as trichophyton or epidermophyton, but as it can infect hair the term trichophyton is better.

E. G. Graham Little.

TERRA (Fernando), TORRES (Magarinos), DA FONSECA (O.), & ARÊA LEÃO (A. E.). **Novo typo de dermatite verrucosa, mycose por acrotheca, com associação de leishmaniosa.** [A New Type of Dermatitis verrucosa due to Acrotheca in Association with Leishmania.]—*Brazil Medico.* 1922. Dec. 9. Year 36. Vol. 2. No. 49. pp. 363–368. With 7 text figs.

The lesion described started as small nodules which broke down in the centre and ulcerated; tough scabs formed which in time became loosened and scarring occurred, but the disease in many places extended at the periphery. The majority of the patients were agricultural labourers, and the first site of the disease was usually the lower limb.

Details are given of a man, 80 years of age. In this case the disease began six years previously as a small nodule on the inner aspect of one heel. This ulcerated and extended over the foot and up the leg almost to the knee. The Wassermann reaction proved negative, but nevertheless the condition was treated as syphilitic with neosalvarsan, salvarsan, mercury injections, with tartar emetic locally and potassium iodide by mouth, without benefit. The fungus Acrotheca was obtained on culture. In contradistinction to the blastomycoses and sporotrichoses the lesions are limited to the skin and do not involve the deeper tissues. In this case sections stained by Giemsa revealed also the presence of *Leishmania tropica.*

The disease is very chronic, persisting for 8–10 years or more; it is painless, causes very little itching, and does not appear to affect the general health.

H. H. S.

SALVAT (P.) & FONTOYNONT (M.). **Contribution à l'étude des Mycoses malgaches. Abcès sous-dermiques dus à l'***Endomyces molardi* **(n. sp.).**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 311–320. With 20 text figs.

This is a case report of a new mycosis observed in a male native aged 26, who had contracted the disease on the East coast. The first lesion noted was a nodule on the inside of the leg, which ulcerated. Similar lesions with similar developments followed, so that the greater part of the left leg became occupied by a sheet of ulceration, with deep fistulae and small subcutaneous abscesses from which pus containing a fungus was obtained. Cultures were best grown on media such as carrot, and agar, treated with glycerine, but the variety of forms was best studied in liquid media. On glycerine agar the fungus forms white downy elevations which become crateriform and a deep yellow. Appearances on various media are described in detail. The morphology of the parasite is fully described and illustrated in a plate.

The authors emphasize the point that on Sabouraud lactose agar media the growth was least characteristic. The identification as an endomyces was complete, and the name Molardi is proposed. Inoculations into the skin of a guinea pig produced a subcutaneous abscess. Inoculation into the peritoneum of a guinea pig and a rabbit resulted in the death of both animals in 34 and 44 days respectively, and from the blood of the guinea pig a few parasites of the same type were recovered.

E. G. G. L.

FONTOYNONT & CAROUGEAU. **Étude sur le Hodi-potsy, dermatomycose malgache.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 424–436. With 2 text figs.

Under the native name here given the authors describe a mycosis very common in Madagascar, first described by Jeanselme, with the title " achromie parasitaire de la tête et du cou à recrudescence estivale," a title which the authors suggest should be adopted as the official name. The eruption disappears in winter, recurs in summer, affects the sexes equally, is commonest in the fourth decade, is exceptional in children and old people, and unknown in babies. It is extremely contagious, affects especially the neck and face, is without subjective symptoms, or glandular enlargements. The condition is identified by the authors with tinea flava of CASTELLANI, who says that the fungus does not grow on culture media. The authors have, however, succeeded in growing it most successfully on Sabouraud's proof medium, both at room temperature and at 37°, but better under the first conditions, and without rubber tops on the tubes. The parasite was examined by LANGERON, who proposes the name " Hermodendron Fontoynonti." The disease was reproduced from a tube culture on a healthy native by inoculation.

E. G. G. L.

HAASE (Marcus), HALL (E. R.) & MARSHALL (C. H.). **Local Blastomycosis : Report of Case.**—*Jl. Amer. Med. Assoc.* 1922. Sept. 2. Vol. 79. No. 10. pp. 820–822. With 3 text figs.

The patient was a negro aged 78, and has been under the observation of Haase for a blastomycosis of the cheek and neck. He was treated with pot. iod. and had recurrences about the old site. Later he had a swelling of the left testicle, which was removed. The epidymis was found to be purulent and from the pus blastomyces was grown. Metastasis to the epidymis is apparently extremely rare.

E. G. G. L.

LANGERON (Maurice). **Sur un champignon d'une otomycose brésilienne :** *Sterigmatocystis Hortai* **n. sp.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 383–384. With 1 text fig.

Langeron contributes a note on the identification of a fungus grown in pure culture by HORTA from the ear of a patient observed in Rio de Janeiro, with the auditory meatus blocked by a dry downy membrane, from which the fungus was obtained. The morphological characters are very fully described, and Langeron regards it as a new species, which he proposes to name as above.

E. G. G. L.

LANGERON (M.) & HORTA (P.). **Note complémentaire sur le *Cladosporium Wernecki* Horta, 1921.**—*Bull. Soc. Path. Exot.* 1922. June. Vol. 15. No. 6. pp. 381–383. With 1 text-fig.

The authors by further study of cultures derived from the case described by Horta [see this *Bulletin,* Vol. 19, p. 160] confirm the opinion then offered that the organism is a Cladosporium (*Wernecki.*).

E. G. G. L.

vi. JOUENNE. **Un cas de mycétome à grains rouges.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. June. Vol. 2. No. 6. pp. 172–173.

vii. HECKENROTH & NOGUE. **Nouvelle observation d'un mycétome à grains rouges et traitement par l'iodure de potassium des pieds de Madura.**—*Ibid.* Oct. No. 8. pp. 226–229.

iii. NOGUE. **Un cas de mycétome à grains rouges des régions sterno-costale et abdominale supérieure.**—*Ibid.* 1921. Vol. 3. Jan.–Feb. No. 11–12. pp. 14–15.

i. A case report of a male native, aged 40, in whom the disease began with an abscess on the sole of the right foot, on which a tumour developed and invaded the whole foot. Red grains were obtained from deeper parts of the swelling, but their cultivation failed. The patient improved with administration of pot. iod., but left the hospital before adequate treatment could be given.

ii. A report of two cases of mycetoma of the foot, both in native women, and in both the sole treatment given was the administration of iodide of potassium, with favourable result. In one case red grains were obtained in the discharge, in the other white grains. Mycelium was demonstrated in each case, but attempts at culture failed owing to contaminations.

iii. The patient was a male Senegalese native, aged 38. The anterior thoracic wall and upper part of the abdomen presented a diffuse infiltration, with numerous sinuses, in the pus of which red grains were abundant. Large doses of iodide of potassium resulted in the healing of all except one sinus, but the patient insisted on leaving at this stage.

E. G. G. L.

i. JOUENNE. **Un cas de mycétome à grains noirs.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. Jan.–Feb. Vol. 3. No. 11–12. pp. 16–21.

ii. ——. **Nouveau cas de mycétome à grains noirs.**—*Ibid.* Mar. No. 13. pp. 36–37.

iii. ——. **Observations de mycétome à grains noirs de la cuisse droite, de la hanche, et de la fesse droite, et de mycétome à grains rouges du pied. Constatations anatomo-pathologiques.**—*Ibid.* May. No. 15. pp. 76–82.

iv. —— **Un cas de mycétome à grains noirs kystique.**—*Ibid.* Nov.–Dec. No. 19. pp. 142–144.

LEGER. **Culture du Champignon.**—*Ibid.* pp. 144–146.

i. The patient, a male native, aged 45, gave a history of an excoriation of the leg by a tree-root, which was followed by an oedematous swelling of the part within 48 hours, and within 14 days showed characteristic sinuses and abscesses with a discharge of black grains, mistaken by the patient for grains of gunpowder. Mycelium was demonstrated, and he was given iodide of potassium, which resulted in complete healing. The site began to discharge again after a time and he then sustained another accident to the same part which was followed by a swelling of the upper third of the leg, when he came under the care of the writer. Sinuses in the swollen area exuded pus filled with black grains, which the author compares to caviare.

A preliminary note from the Institute of Biology, to which the examination was submitted, states that the information already obtained allowed of the classification as a Madurella.

ii. The patient was a male native, whose father suffered from the same affection due to the same type of fungus. The patient apparently contracted the disease in the site of a sore produced by the extraction of a Guinea worm in the right foot. From sinuses in the foot black grains were obtained in large quantity. No further indication of the species is given.

iii. The patient was a native of Mauritania, who had travelled much, and the country of origin of his disease could not be ascertained. When seen he had a large scar from buttock to thigh, on the posterior aspect, and lesions, which were regarded as gummatous, and rupial ulcers on the anterior and inner aspects of the right thigh. The first diagnosis—tertiary syphilis—was changed to mycetoma on the observation of black grains in the discharge, which were submitted to the Institute of Biology for identification. The author conjectures that the mycetoma was a secondary infection of a syphilitic ulcer, but the patient died before a Wassermann test could be made. A sinus running from the iliac crest to the coccyx in the substance of the buttock was found to be filled with black grains.

A second case of mycetoma with red grains, in a native woman, is also recorded by the author—in this case the left foot being affected and presenting all the clinical signs of Madura foot. The normal tissues of the foot were found to be replaced by a grey substance resembling the grey matter of the brain, enclosed in a hard fibrous shell, and breaking through this shell in places. The red grains were found disseminated throughout the grey substance. The author contrasts the appearances of the black variety, producing little more than channels, like worm-holes in fruit, and the much more serious destruction caused by the red variety, and regards these cases as typical of the action of the two infections.

iv. The patient, a male native, showed a cystic tumour the size of an orange behind and below the internal malleolus of the right foot, and an oval scar covered with dry scabs, on the sole of the same foot. From this site, the patient said, discharge took place from time to time, containing "small pieces of coal." The disease had first showed itself in the Cameroons. The cyst was enucleated without difficulty and found to be full of typical black grains. Some of these were investigated by Leger, who contributes the second part of the memoir, and pure cultures were grown on Sabouraud media at room temperature. The first colonies were a greyish white, with eccentric increase, the middle of the growth being at first raised, later crateriform. Still later there appeared round this crater a border of little black heads.

Detailed examination of cultural characteristics allowed of the identification of the organism with "*Madurella Mycetomi,* Laveran, 1902."

E. G. G. L.

i. BONREPEAUX. **Un cas de mycétome à grains noirs.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1921. Apr. Vol. 3. No. 14. pp. 57–59.

ii. LHUERRE. **Un cas de mycétome à grains noirs.**—*Ibid.* May. No. 15. pp. 84–85.

i. The patient was a man, aged 26. The initial injury was an excoriation of the knee from a shrub six years previously. In the site of this accident there was a phagedenic ulcer from which filarial organisms could be demonstrated. Later from the same part of the swollen leg mycetomatous elements with black grains were obtained. The author discusses the possibilities of an accidental coincidence or a causative connection between the filarial infection and the mycetoma, and thinks that the former infection prepared the way for the latter.

ii. The patient was a male native who had sustained some injury to the thenar eminence, which he treated with the application of "leaves" (nature unknown). The thumb swelled rapidly, and numerous sinuses developed in the swelling, from which black grains could be pressed. Six intravenous doses from 15 to 90 cgm. of novarsenobenzol at intervals averaging a week resulted in complete cure of the condition.

E. G. G. L.

RAYNAUD (M.), MONTPELLIER (J.) & LACROIX (A.). **Un cas de mycétome du pied à** *Nocardia madurae*, **chez un indigène algérien.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 379–381.

The patient was a native, aged 71, with a swelling of the right foot at first taken to be tuberculous. White grains were found in the pus derived from deep-seated abscesses in the foot. Cultures were obtained on Sabouraud media, and identified as *Nocardia madurae.*

E. G. G. L.

DYKE (H. W.) & MACFARLANE (N. M.). **A Case of Madura Foot.**—*S. African Med. Rec.* 1922. July 22. Vol. 20. No. 14. pp. 270–271. With 1 text fig.

The patient was a male native aged 30, who contracted the disease in Zululand. The whole right foot was affected up to the ankle, and it was consequently amputated. " Mycelium " was demonstrated from the sinuses on the foot but no further identification of the organism present was attempted.

E. G. G. L.

CORNWALL (J. W.) & LAFRENAIS (H. M.). **A New Variety of Streptothrix cultivated from Mycetoma of the Leg.**—*Indian Jl. Med. Res.* 1922. July. Vol. 10. No. 1. pp. 239–248.

Material for culture was obtained from a deep sinus in a tumour occupying the middle third of the leg of a Hindu cultivator aged 55. Aerobic culture succeeded best, but the organism could be grown anaerobically; the best medium was glucose agar and the optimum temperature 37°. Morphologically, the organisms " did not differ materially from the appearances which have often been described and illustrated," but the fact that it was " acid fast " and " alcohol fast " differentiates it from other varieties of *Streptothrix madurae.*

E. G. G. L.

RIDLEY (H. N.). **Plant Dermatitis.**—*Jl. Trop. Med. & Hyg.* 1922. July 15. Vol. 25. No. 14. pp. 225–227. With 1 text fig.

Ridley calls attention to the poisonous properties of the Order *Anacardiaceae* and especially of the genera *Gluta* and *Melanorrhoea,* known under the popular name " Rengas " in Malaya. He suggests that perspiration may play a part in the production of dermatitis, those who sweat most being most affected. Alkalies seem to neutralize the poison, and alkaline compresses are recommended in treatment of the dermatitis.

E. G. G. L.

ONORATO (R.). **Il fagedenismo in Tripolitania.** [Phagedaena in Tripoli.]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1920. Jan., Feb., Mar., Apr. and May. Vol. 1. Nos. 1, 2, 3, 4 and 5. pp. 33–49. With 5 text figs. and 9 diagrams; 83–102. With 10 text figs.; 107–143. With 1 text fig.; 155–196; 199–264.

These observations are based on experience in the Tripoli civil hospital between August, 1912, and July, 1919. Professor Onorato makes full use, however, of the literature, and the result is a very full and interesting description of phagedaena. A number of tables are printed in support of the contention that it is becoming less common as a result of the introduction of Italian civilization. The high incidence in August and September is attributed to the two factors of drought and heat. All ages are found to be liable to infection, but the following figures show that the industrial period of life is the most dangerous.

Ages.	*Average yearly incidence for period* 1912–19.	*Ages.*	*Average yearly incidence for period* 1912–19.
0–5	1·3	45–50	3·0
5–10	3·0	50–55	2·0
10–15	5·3	55–60	2·0
15–20	8·4	60–65	1·4
20–25	6·1	65–70	1·4
25–30	7·0	70–75	0·4
30–35	6·0	75–80	—
35–40	6·0	80–85	0·1
40–45	3·6		

The liability to trauma and to infection are regarded as factors of primary importance. Sex and nationality show variations only because of the variations in occupation to which they correspond. Thus women, as has frequently been observed, are less subject than men. Onorato points out that the Arab women who are especially tied to their homes are the least subject of all women. Any pre-existing lesion, such as those of syphilis and tuberculosis or the scarification made in vaccination, are liable to become phagedenic.

Numerous organisms are described as being found regularly in the ulcers; in the superficial strata thereof many cocci and bacilli; in the middle strata, more abundant bacilli and a few spirochaetes; in the deeper layers the spirochaetes are rather more numerous. Le Dantec's bacillus and Vincent's spirochaete are described as the specific infective agents. Professor Onorato is convinced that these organisms exist in a true symbiosis and are not different forms of a single micro-organism. He draws attention especially to the fact that whereas Le Dantec's bacillus divides transversely, the spirochaete divides longitudinally (not transversely as WECHSELMANN has stated). These symbiotic agents may be capable of causing ulceration each in the absence of the other, but their association renders them especially virulent. The function of the spirochaete is to penetrate from cell to cell, causing the death of the tissue by its toxins. The more active the lesion the greater is the number of spirochaetes found in the deeper tissues. The appearance of pyogenic cocci is invariably the result of secondary infection. The spiro-bacillary symbiosis is responsible not only for phagedenic ulcer in tropical areas but also for the following diseases arranged in order of importance :—Vincent's angina, ulcero-gangrenous stomatitis, noma, spontaneous gangrene of the genital organs. In tropical regions the infection is endemic. Various experiments with the specific agents both in animals and man have been made by the writer and confirm the importance of the symbiosis. Naturally the experimental infection in man was not allowed to proceed far lest it should reach a stage beyond control, and for the same reason no experiments were undertaken on human mucosa. Prophylaxis consists in oral and general hygiene and isolation of the sick. In treatment local application of iodoform is most effective while injections of arsenobenzol are indicated in all forms of the disease. Records of cases treated and a useful bibliography complete the article.

J. Rosslyn Earp.

SEN (K. C.). **Observations on "Ulcus tropicum" in North Palestine.** —*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 286–289. With 1 plate.

This paper is based on a study of 21 cases ; the legs, ankles or feet were the sites affected, and the time was limited to the months August-October. Experiments to inoculate the healthy skin failed, as well as hypodermic inoculation of the discharge. Spirochaetes and the fusiform bacillus were found in all the sores ; in a few cases streptococci, scanty in number, were obtained. The most satisfactory treatment was found to be by irrigation with warm saline ; a ligature is then put on the leg 4 in. above the ulcer ; the latter is touched with pure hydr. perchlor., and after one minute again washed with saline and the ligature removed and normal saline dressings applied three times a day thereafter.

E. G. G. L.

BEURNIER. **Traitement de l'ulcère phagédénique des pays chauds par leur exposition aux rayons solaires.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Nov. Vol. 2. No. 9. pp. 259-262.

The method of treatment is thus described. The ulcer was cleaned up with cotton wool soaked in weak solution of pot. permanganate, and exposed to direct sunlight for periods gradually augmented from 20 minutes to three hours. After exposure the part was dressed with Reclus's ointment, or painted with antiseptic lotions, or dusted with Vincent's powder. The author gives preference to the latter, but emphasizes his belief that the good results he obtained must be attributed to the sunlight rather than to the dressing. When ulcers fail to heal under this treatment the author suggests that syphilis should be suspected as an additional factor.

E. G. G. L.

BAUVALLET. **A propos du traitement de l'ulcère phagédénique.**—*Bull.. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Oct. Vol. 2. No. 8. pp. 219–224.

Bauvallet recommends in preference to all other methods of treatment the complete surgical ablation of the ulcer, this method being available only in superficial ulcers, but their size is no objection. Minute details are given of the surgical technique employed. The most rigid asepsis is demanded. The tissues are removed down to the surface of muscle, and complete haemostasis must be secured by ligature and tampons. Dry dressings are applied.

In cases where for any reason operation is impossible, the author describes another procedure. The wound is painted with solution of silver nitrate, 1/10 to 1/20, and then a zinc electrode attached to a Leclanché battery is passed over the surface. The result is to produce double nitrate of zinc and silver, which acts as a caustic. The wound is exposed to the sunlight to dry for a few minutes, or, preferably, dried quickly with a hot air douche, and the following zinc paste applied all over the site with a spatula:—Zinc oxide, talc, sterile oil, equal parts. No dressings are used. The procedure may have to be repeated.

E. G. G. L.

VAN NITSEN (R.) & WALRAVENS (P.). **La vaccinothérapie dans les ulcères tropicaux.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Vol. 2. No. 1. pp. 111–112.

The authors succeeded in obtaining cultures of the fusiform bacillus, which is a strict anaerobe, on sterile ascitic fluid covered with a layer of sterile paraffin. The growth contained an abundance of the associated bacteria, the fusiform bacillus and the spirillum. Emulsions of the associated bacteria were sterilized, and a vaccine prepared which had the following composition per cc. : fusiform bacillus, 80 millions ; spirillum, 120 mill. ; diplococcus, 300 mill. ; staphylococcus, 300 mill. ; streptococcus, 200 mill. Doses of ¼, ½, ¾ and 1 cc. were given at intervals of two days. Some 200 patients were tested in this way, but the authors found no improvement with the treatment and pronounce it of no curative value.

E. G. G. L.

RAYNAUD (M.), MONTPELLIER (J.) & LACROIX (A.). **Phagédénisme chronique serpigineux de l'aine (ulcère serpigineux vénérien).**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 641–646. With 3 text figs.

This is a case report of a venereal ulcer in a man aged 43. The first lesion noted was a soft sore which appeared on the prepuce two days after coitus, and suppuration of the inguinal gland followed. Three months later on the skin over the anterior superior iliac spine on the left side a " pimple " showed which became the starting point of a large ulceration. Wassermann reaction was reported as " 4 plus." Repeated treatment with injections of "914" produced no clinical improvement. Many attempts to find Ducrey's bacillus in smears failed entirely. Cultures (anaerobic as well as aerobic) on various media, including Sabouraud's, gave a few colonies of *Staph. albus* only. An entirely similar lesion clinically was produced by inoculation of fragments hypodermically into a healthy man, and the resulting ulcer was removed surgically and did not recur.

E. G. G. L.

BROWN (David M.). **Serum in the Treatment of Veldt Sores.** [Correspondence.]—*Brit. Med. Jl.* 1922. Aug. 5. pp. 236–237.

A medical man suffered from extensive and chronic veldt sores on the buttocks, which resisted all treatment. Brown injected 4,000 units of antidiphtheritic serum supplied by MERCK at least seven years previously. Improvement commenced within three days and the sores had entirely healed within 14 days [see this *Bulletin*, Vol. 16, p. 153].

E. G. G. L.

ONORATO (Raffaele). **Il granuloma ulceroso delle pudende in Tripolitania.** [Ulcerating Granuloma of the Pudenda in Tripoli.]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1921. Mar.-Apr., May–June, July–Aug.–Sept., Oct.–Nov.–Dec. Vol. 2. Nos. 3–4, 5–6, 7–8–9 & 10–11–12. pp. 58–64. With 1 text fig.; 68–96. With 1 text fig.; 110–127 & 129–137.

In the years 1912–20 the writer has treated a large number of cases of granuloma inguinale. The paper is based, however, on 31 cases which have been under close and systematic observation in the Tripoli hospital, of which he is the senior surgeon. These observations and a large number of laboratory experiments have resulted in a very complete and interesting description of the disease. The original contribution consists chiefly in work on the specific cause. Among a large number of bacteria found in the lesions, Professor Onorato inculpates certainly the *Calymmatobacterium granulomatis*, which he found almost constantly present. He thinks it probable, however, that this organism may not be the only one capable of producing the granuloma, and is strongly inclined to consider a spirochaete, which he describes and which differs from *S. pertenuis* only by the absence of chromatin granules and by its constantly pointed extremities as the specific cause in a certain number of cases (10 out of the 31 in this series). Laboratory experiments on guinea-pigs, rabbits and dogs proved both these organisms and especially *C. granulomatis* to be pathogenic, but Prof. Onorato was unable to reproduce the granulomatous lesion either in animals or in man.

Prophylaxis consisted in general and local hygiene. Treatment is varied. Whenever complete extirpation is possible by surgical intervention this should be carried out. In other cases X-rays or radium may be effective. In cases of spirochaete origin 2–6 injections of arsenobenzol will effect a cure. When the infection is due to *C. granulomatis*, treatment consists in 8–11 intravenous injections of 100 cc. of solution 1/1000 tartar emetic in normal saline, X-rays being used as adjuvant treatment.

J. Rosslyn Earp.

BEESON (B. Barker). **Granuloma Inguinale with Lesion on the Lower Lip. Report of a Case.**—*Arch. Dermat. & Syph.* 1922. Sept. Vol. 6. No. 3. p. 343. With 1 fig.

A case report in a male negro, who first developed ulcer of the groin and later on ulcer of the lip, from both of which sites the characteristic organisms were obtained. The patient was cured by intravenous injection of tartar emetic.

E. G. G. L.

Goodman (Herman). **Ulcerating Granuloma (Granuloma Inguinale).**—*Jl. Amer. Med. Assoc.* 1922. Sept. 2. Vol. 79. No. 10. pp. 815–819. With 5 text figs.

The author describes eight cases seen by him, typical in every way of the disease as seen in the tropics. Only in the first of these cases *Spirochaeta aboriginalis* was found, but not *Calymmatobacterium granulomatis.* In all the other cases the latter organism was demonstrated.

The author has seen several cases in New York City, which are lightly touched on without detail, but one case is more particularly described, as it presented a lesion of the tongue. The patient was probably syphilitic as well. Treatment with tartar emetic injections gave uniformly good results.

E. G. G. L.

Morales Macedo (Carlos). **El primer caso de granuloma venéreo observado en el Perú.**—*Cronica Méd.* 1922. June. Vol. 39. No. 708. pp. 201–208.

This is believed to be the first recorded instance of granuloma venereum in Peru. The case, a Peruvian, 28 years of age, was sent to hospital with a diagnosis of "Cancer of the Pubis." The condition seems to have started spontaneously; there was no history of trauma, which some believe to be the invariable forerunner. A small papule was first noticed and in six months the disease had extended over the whole of the suprapubic region, the left groin, the inguino-scrotal fold, round the anus and on to the gluteal area. There was no involvement of lymphatic glands. The Wassermann reaction was negative and the blood condition generally within the limits of the normal. *Calymmatobacterium granulomatis* was seen in smears from the surface and deeper parts mixed with staphylo- and streptococci and treponemata.

Tartar emetic in 1 per cent. solution was injected intravenously every two or three days, the dose being increased from 2 to 12 cc. At the time of reporting twenty injections had been given [the total quantity of antimony tartrate is not stated] and the ulcer had been reduced to half the size it presented on admission. Locally, the only treatment was a simple boric acid dressing.

H. H. S.

Lynch (Kenneth M.). **Tartar Emetic in the Treatment of Granuloma Inguinale and other Granulomata and Granulating Ulcers.**—*Southern Med. Jl.* 1922. Sept. Vol. 15. No. 9. pp. 688–692. With 4 text figs.

Two case reports are submitted, one of a negress with a very extensive granuloma occupying the anus, perineum and lower abdomen. Thirty injections of tartar emetic (2·72 gm. of the drug) were required to produce cure. In the second case there was concomitant syphilis and gonorrhoea, and the tartar emetic injections were given alternately with injections of arsphenamine. She was regarded as cured after twelve injections of antimony and three injections of arsphenamine. Three cases of ulceration of unknown causation were treated with tartar emetic injections with success.

E. G. G. L.

CLAASSEN (H. L.). [**Granuloma Inguinale.**]—*Ohio State Med. Jl.* Columbus. 1922. Oct. Vol. 18. No. 10. p. 685. [Summarized in *Jl. Amer. Med. Assoc.* 1922. Nov. 4. Vol. 79. No. 19. p. 1639.]

The author describes four cases in persons who had never been to the tropics. Donovan bodies were not constantly present.

E. G. G. L.

i. NOGUE. **Malades ayant eu des nodosités juxta-articulaires disparues à la suite d'un traitement par le novarsénobenzol.**—*Bull. Soc. Med.-Chirurg. française de l'Ouest-Africain.* 1921. Mar. Vol. 3. No. 13. pp. 35–36.

ii. —— **Malade atteint de nodosités juxta-articulaires et non guéri par l'arsénobenzol.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. p. 488.

i. The patient, a male native aged 40, was admitted to hospital for pulmonary tuberculosis, and was found to have nodosities over each olecranon, and on the ninth right rib. The tumours were painless swellings, of the consistence of cartilage, and apparently adherent to periosteum. There were scars on the penis which suggested a previous syphilis. After five graduated injections of novarsenobenzol, one tumour had disappeared entirely and the other two diminished to vanishing point. The author cites another personal case, in a native woman, with nodosities about the elbows, and a history of her mother and grandmother having had similar tumours. No other investigations seem to have been made.

ii. The patient, a male native, received seven injections of novarsenobenzol increased from 15 to 90 cgm., combined with administration of pot. iod. by the mouth, without appreciable diminution of the nodules which covered the elbows and knees.

E. G. G. L.

DE QUERVAIN (F.). **A propos des nodosités juxta-articulaires.**—*Gaz. des Hôpit.* 1922. Aug. 8 & 10. Vol. 95. No. 62. p. 997.

This is a short note emphasizing the author's priority for the observation of the syphilitic causation of juxta-articular nodules, and explaining the differences in histological findings of different authors by the suggestion that the histology varies with the age of the nodule.

E. G. G. L.

VAN DIJKE (M. J.) & OUDENDAL (A. J. F.). **Voorkomen, bouw en oorzaak der Nodosités juxta-articulaires (van Jeanselme) bij Inlanders.** [Occurrence, Structure and Cause of Jeanselme's Nodosités juxta-articulaires in Natives.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 4. pp. 413–440. With 3 black and 7 coloured plates.

After reviewing the literature on their subject, the authors quote their findings in 36 cases, 32 of which showed signs of yaws and 1 of syphilis, whilst 2 admitted to have been suffering from yaws before. They had no opportunity of testing the influence of salvarsan, but they obtained 11 nodules from 10 patients for examination. A minute anatomical description is given with good illustrations, inducing the authors to classify the nodules as infectious granulation tumours.

Using Levaditi's silver impregnation method, the authors succeeded invariably in showing the presence of spirochaetes in the pathological tissue. Animal experiments are still necessary to obtain certainty whether these spirochaetes are those of syphilis or yaws.

W. J. Bais.

ONORATO (Raffaele). **L'ainhum.**—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1920. June. Vol. 1. No. 6. pp. 268–297. With 1 plate.

The pathology of ainhum is discussed both from observation and from the literature, and also the differential diagnosis. Two of the three cases reported by the writer are of interest, the first because it occurred in a female Arab of white race, and the second because it involved the loss of all the toes of both feet. Although the second case was not seen until all the toes had either fallen off or been amputated by the patient, the writer is persuaded by the history and by a careful exclusion of other possibilities, *e.g.*, leprosy or syphilis, that this was a genuine case of ainhum. He claims that it is the first reported case in which all toes have been lost from this disease.

The anatomical changes found in the affected digit may be ascribed entirely, the writer believes, to a fibro-lipomatosis resulting from an absence of blood supply due to an irregular proliferative process which commences in the Malpighian layer of the skin. The various descriptions of the morbid anatomy of ainhum found in the literature simply represent different stages in this process. Of the various aetiological theories he favours that which considers chronic irritation as the cause and points out that where several members of a family have been attacked this may be due rather to common habits than to heredity or infection. He considers that the onward march of civilization will result in the disappearance of the disease, but to attempt at present to persuade natives to wear shoes would be a waste of time.

J. Rosslyn Earp.

HUDÉLLET (G.). **Lésions osseuses dans l'aïnhum.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 350–352. With 1 text fig.

An excellent X-ray photograph is reproduced of the appearance of the fifth toe on the right foot, nearly separated from the foot by the disease, and shows a condensing as distinguished from a rarefying osteitis.

E. G. G. L.

VIEIRA (João Paulo Botelho). **Pemphigus tropical. Ensaio therapeutico pelo oleo de choolmoogra. Nota prévia.** [Tropical Pemphigus treated with Chaulmoogra Oil. Preliminary Note.]—*Brazil Medico.* 1922. Mar. 11. Year 36. Vol. 1. No. 10. pp. 117–118.

An account of two cases of "tropical pemphigus" successfully treated by injections of chaulmoogra oil after the failure of other methods. Both patients were women. One required 60 intramuscular injections, the other 45. Dose not given in either case.

F. S. Arnold.

NICOLLE (C.). **Sur trois nouveaux cas de** ***Xeroderma pigmentosum*** **observés en Tunisie.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 240–241. With 1 plate.

——. **Complément de la VIe observation tunisienne et XIe cas.**—*Ibid.* pp. 241–242.

CUÉNOD & SOLOVIEF (P.). **XIIe cas de** ***Xeroderma pigmentosum*** **observé en Tunisie.**—*Ibid.* pp. 242–244. With 1 photograph and 2 figs.

JAMIN & CUÉNOD. **XIIIe cas de** ***Xeroderma pigmentosum*** **observé en Tunisie.**—*Ibid.* pp. 245–247.

These papers describe three new cases, which brings the number of examples of the disease reported in Tunis to 13, 11 of which were indigenous. The first of the new cases (No. 11 in the list) was a brother, aged 5 years, of No. 6, previously described and now re-observed. The second was a little girl with characteristic lesions about the eyes and on the face and arms. Sections of the skin showed the typical histology. The third case, a girl of 5, first showed the disease, at the age of 3, on the limbs and face, the eyes also being affected and the scalp. E. G. G. L.

GOUGEROT (H.). **Prophylaxie des cancers cutanés. Radiolucites chroniques sur terrains radiosensibles et xeroderma pigmentosum.** —*Rev. pratique des Maladies des Pays Chauds.* Paris. 1922. Oct. Vol. 1. No. 1. pp. 34–52. With 1 plate.

Gougerot in this interesting paper states certain propositions which his great authority compels one to examine carefully, but which are not altogether in accordance with English experience. Thus he says that Xeroderma pigmentosum is "frequent," but he would seem to widen the category to include adult and senile epitheliomata ascribable to light, and he suggests that X-ray burns are of the same order and that the solar ray "must have elements analogous to X-rays." But a special fragility of the skin is to be assumed to explain this particular vulnerability, and hereditary syphilis is "to be suspected" as the underlying cause. The author then discusses at length the particular elements in the solar ray which may be responsible for the injury, and claims to be able to exclude the light rays, heat rays, and ultra-violet rays, and believes that the harmful rays are most probably the rays with short waves, situated just beyond the ultra-violet. The special fragility of the skin is analysed into two factors, (1) precocious senility, and (2) a naevoid degeneration of the skin, and the latter factor the author regards, with GAUCHER, as pre-eminently a syphilitic manifestation. Antisyphilitic treatment is to be tried, therefore, in Xeroderma pigmentosum, as well as protective measures against sunlight. E. G. G. L.

PAWLOWSKY (E.) & STEIN (A.). **Des causes de l'apparition des taches bleues chez l'homme.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 558–560.

The authors injected an emulsion of the salivary glands of *Phthirius pubis* into a human subject and produced the blue stains characteristic of the bite of the parasite. Extract of the stomach of the parasite had no such effect. E. G. G. L.

MALARIA.

i. SPENCER (H. A.). **Malaria as it occurs upon the Middelveld of the Transvaal.**—*S. African Med. Rec.* 1922. Sept. 23. Vol. 20. No. 18. pp. 342–349.

ii. ——. **Malaria on the Lowveld.**—*Ibid.* 1923. Jan. 13. Vol. 21. No. 1. pp. 3–7.

i. On the middleveld, at altitudes of from 4,000 to 6,000 ft., malaria is rife but unrecognized, showing itself clinically as chronic rheumatism, bronchitis, chronic headaches, abortion. The evidence offered is partly direct (the detection of plasmodia in the blood), partly clinical (the association of these symptoms with the more classic signs of malaria), partly therapeutic (the clearing up of these ills under quinine, with or without arsenic). If this interesting paper stimulate local inquiry to check these symptoms case by case with microscopic findings it will produce valuable results. The statement that malaria can be acquired in the Himalayas at 12,000 ft. must be questioned. About half that altitude may be accepted in practice as the safety line.

ii. The riverine plains and valleys, cut out by erosion from the middleveld, which rises abruptly from them, show such pictures as this. Ten years ago, a settlement with canals and water-furrows, a veritable garden of greenness, hills and valleys for miles around smiling with crops, summer and winter ; the appearance of epidemic malaria ; the houses measured for screening ; an estimate obtained working out at a few pounds a house ; nothing done. At the present time : in winter not a crop to be seen ; in summer some to be found if the search be sufficiently enduring ; last winter three deaths in three days in a household of five persons, a typical instance ; an epidemic mortality of 15 per cent. Little wonder that those who have had to live on the middleveld on duty look back on their experiences with horror. And the ghastly details of the picture avoidable.

[When one considers the climatic conditions—deep, humid, stagnant valleys, with heat, tropical in summer, soft and spring-like in winter, the syringa blooming the year round—one cannot wonder that malaria is rife. But one cannot but be amazed that, on the basis of diagnostic technique entirely inadequate, it should be definitely stated (the author is not concerned positively or negatively in this statement) that, though one may search the whole world and find, under similar conditions, ankylostomes everywhere else taking their inevitable toll of life, health and happiness, yet here we have the great exception ; that here alone are these pests absolved from all place and share in this appalling mass of misery.]

Clayton Lane.

LEGER (M.) & BAURY (A.). **Index endémique du paludisme au Sénégal durant la saison sèche.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 766–770.

The figures here given have this general interest, that they indicate no parallelism between the parasitic and splenic indices. For instance, at Sor the first is 35 and the second 4, whereas in Khombole they are respectively 3 and 27. Of 91 children at Dakar, 57 were infected, 27 with *Plasmodium praecox*, 21 with *P. malariae*, and 4 with *P. vivax*.

C. L.

LEGER (Marcel), BÉDIER (E.) & BAURY (A.). **Dakar et ses environs : index du Paludisme aux diverses saisons.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1006–1010.

The seasonal variation in the amount and kind of malaria in over 500 children and in 62 adults varied from 64 per cent. upwards in the former and stood at 33·8 per cent. in the latter. The subtertian parasite was the commonest, 56·5 to 67 per cent. ; the quartan next, 35 to 42·6 per cent. ; while the tertian had a maximum, between 5 and 10 years of age, of 0·9 per cent.

C. L.

GAMBIER (A.). **Index endémique paludéen de la ville de Bamako (Soudan Français).**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 933–935.

Of 265 children examined, 203 showed malarial parasites, presumably in thin films, the monthly percentages from May to September being 60, 67·5, 84·5, 88·8, 85·5. Of the 202 cases 3 showed *Plasmodium malariae,* 1 *P. vivax,* 2 crescents, and the rest schizonts of *P. praecox.* In 1914 LEGER found that in the wet season 60 per cent., and in the dry one 50 per cent., were infected with *P. malariae.* SEGUIN confirms the present predominance of *P. praecox.*

C. L.

STRICKLAND (C.). **A Malaria Survey of Sawantwadi State.**—*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. pp. 7–15. With 1 map.

This full and scientifically conducted investigation must be directly consulted if the most is to be extracted from it. It shows that, contrary to the local belief, malaria is indigenous. The malarial foci lie in the foothills, the lower undulating country being relatively free. Of the many Anopheles found, the one bad carrier was *A. maculatus,* discovered in all ravines flowing down from the hills, and it is concluded—making due allowance for the fact that paddy cultivation was not going on at the time of the investigation, and that a relatively unfavourable insect host in swarms may do as much damage to man as an optimum one in lesser quantity—that *A. maculatus* was the main vehicle of infection in man. Since it is a jungle hater, the advised remedy is the encouragement of a narrow strip of jungle along the ravine banks. Considerable stress is laid upon the importance of encouraging small fish in wells and paddy fields and the exclusion of larger and fish-eating species. The uncommon enterprise of the Sardesi Maharaj deserves success.

C. L.

UKIL (A.). **Observations sur le paludisme pernicieux et la fièvre bilieuse hémoglobinurique au Bengale (Indes anglaises).**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 962–970.

The Professor of Pathology in the high-sounding " National Institute of Medicine, Calcutta," has seen 200 cases of malaria with grave cerebral or abdominal complications, four of them with haemoglobinuria. In some of these cases—the text does not supply the number, diagnosis is therapeutic—they have recovered after quinine. The symptoms are as usual. The prognosis is considered good if treatment be instituted early, to effect which no new considerations are advanced.

All the haemoglobinuric cases came on after dosage with 15 gr. of quinine daily. In three, young forms, and in one, gametocytes, of the subtertian parasite were found.

C. L.

VAN LAAREN (G. F.). **Magelang geen malaria-vrije plaats.** [Magelang (Java) not a Malaria-free Locality.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 1. pp. 27–29.

Magelang has been hitherto considered as free from malaria, and accordingly indicated as a health resort for malaria patients. Van Laaren quotes authors who assert the contrary, and mentions a few facts to confirm them. Among 2,678 school children (5–16 years), 331 had enlarged spleen, and of these 61 parasites in the blood. Of the Anopheline mosquitoes caught a high percentage was *Anopheles aconitus*, well-known as a malaria-transmitting species.

W. J. Bais.

GIBSON (C. C. G.). **Malaria and Mosquitoes in Belize, British Honduras.** —*Jl. Roy. Army Med. Corps.* 1923. Jan. Vol. 40. No. 1, pp. 38–43.

In a military area, vacant since 1886, bounded on the north and east by the sea, on the south by the city of Belize, and on the west by a swamp, were quartered 250 men of the Royal Sussex Regiment, from December 1919 to July 1920. The barracks had gauze-fitted doors and windows, but their warped, ill-fitted woodwork made them merely insect traps. Latrines are situated over the sea 20 yards from the shore, and, in spite of the praiseworthy efforts of numerous catfish, the muddy bottom for a mile out to sea is so contaminated that the water is unfit for ablution. Water for all purposes is limited to that which can be collected from roofs and stored. If the usual eighteen-mile sea breeze blow, life is endurable, and a mosquito net can be dispensed with. If the wind drop the sweat-soaked men either try to endure life in a muslin net, for ordinary mosquito netting is useless against the persecuting sandfly, or they seek to escape from these pests by flight to the bathing shed, built over the sea, as are the latrines, where they could often be seen crying in their misery. Anopheles bred over the whole military area in pools in the grass, in landcrab holes, in tree stumps and boles. Small wonder that in seven months this regiment had a malarial incidence of 57·2, whilst the 1st West India Regiment, which followed them, went one better with 84·8 per cent. One is left guessing regarding the nature of the military urgency which necessitated the infliction of all this misery and incapacity.

C. L.

ORTICONI (A.). **Les ravages du paludisme en Corse.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 683–686.

This *Bulletin* has recently illustrated again and again the great interest and importance which the members of the Société de Pathologie Exotique attach to the question of malaria in Corsica, and the apathy which they attribute to the central Government in respect to it.

C. L.

FABBRI (G.). **La malaria nella questione meridionale.**—*Ann. d' Igiene.* (Supplement.) 1922. Vol. 32. 62 pp.

The " Questione Meridionale " is fundamentally agrarian in nature, but inextricably mixed up with difficulties technical, economic, juridical and quasi-political. This essay is ostensibly concerned with the manner in which malaria is wrapped up in the question, in that it " constitutes the first and greatest obstacle to the solution of the whole southern problem."

The author shows that from the time of the promulgations in Rome in 267 A.U.C. (486 B.C.), from the era of Pope Zacchary to that of Sisto IV, from Paul V to Pius IX, from Cato to Napoleon and Mazzini, all legislative measures have been brought to naught by the stubborn resistance of malaria.

Quotations are given from Giustino Fortunato, from Stendhal's *Promenades dans Rome* and the *Vie de Napoleon,* from LANCISI, who in 1717 wrote his work *De noxiis paludum affluviis eorumque remediis,* and stated that marshes were the cause of the fever owing to the transformation of minute worms into " stridulous culices," and that " the poisoned animals kill not by the wounds they inflict, but by infusing a poisoned liquid through the wounds." Dante, Horace, and even Homer are drawn upon (the last appears strange when quoted in Italian). Coming to more modern times, the author briefly reviews the history of malarial research, and tables are given to show how greatly malaria has been reduced between 1906 and 1914 as a result of preventive measures. He next passes to the Isthmus of Panama, and describes GORGAS's anti-mosquito work and the success which attended it. The history of the introduction of Cinchona is then spoken of, and further statistics given as to the general diminution of the deaths in Italy from malaria from 15,987 in 1888 to 2,042 in 1914. He shows how the spade and the plough, proper cultivation of the soil, coupled with protection from, and war against, mosquitoes, have worked wonders in reducing the malarial incidence.

The whole paper is delightfully written and interesting to read, and might well be entitled " Literary Wanderings in the History of Malaria."

H. Harold Scott.

ROMBY (Paolo). **Studi sulla malaria.**—*Giorn. di Med. Milit.* 1922. Oct. 1. Vol. 70. No. 10. pp. 449–460.

A valuable and careful exposition of fifteen years' experience of malaria in many of the countries forming the Mediterranean littoral. Primary carriers, those showing parasites without present or previous symptoms, are given as 38 out of 140 specially examined with that end in view. Having not infrequently observed the simultaneous presence of the tertian and subtertian parasites, he has no use for the unity of species, although he holds that he has seen conversion of *Plasmodium vivax* into " *P. immaculatum.*"

C. L.

RIEUX (J.). **L'évolution de l'infection malarique chez les paludéens.**—*La Médecine.* 1922. Dec. Vol. 4. No. 3. pp. 187–191.

——. **A propos du "paludisme chronique" des paludéens rapatriés.**—*Jl. des Practiciens.* 1922. June 3. Vol. 36. No. 22. pp. 353–356.

A general consideration among the repatriated to France leads again (this *Bulletin,* Vol. 19, p. 577) to a discussion on chronic malaria.

Rieux reiterates his conviction that malaria dies out, when reinfection is impossible, in from 12 to 15 months, and he lays down the axiom that to diagnose malaria without finding parasites in the peripheral blood is unscientific and unacceptable. Yet he gives no warning to the ordinary French practitioner (to whom the papers are addressed) that the finding of parasites in the peripheral blood of those whom subsequent examination shows to be actually harbouring them may not be accomplished by the most skilful; so that he who refuses to admit the possibility of malaria unless he find the parasite will constantly fail in maintaining his diagnostic reputation and in carrying out his duty to his patients.

C. L.

MÜHLENS (P.) & KIRSCHBAUM (W.). **Parasitologische und klinische Beobachtungen bei künstlichen Malaria- und Recurrensübertragungen.** [Parasitological and Clinical Observations on Malaria and Relapsing Fever Experimentally Transmitted.]—*Ztschr. f. Hyg. u. Infektionskr.* 1921. Vol. 94. No. 1. pp. 1–28. With 12 figs.

The writers have infected 88 cases of general paralysis of the insane with malaria or relapsing fever. Four of them died, three from heart failure and the fourth from haemorrhages attributed to quinine idiosyncrasy. Infection was by direct transfer of defibrinated blood from case to case. In this way benign tertian malaria was transmitted to 59 cases, 20 of them forming a continuous chain of descent, the rest being collaterals. Quartan infection was passed on to 5 cases, 3 in direct descent; and subtertian infection to 9 cases with a direct chain of 4. The tertian chain extended from March of one year to June of the next. In no instance did tertian breed other than tertian, quartan than quartan, subtertian than subtertian. Incubation periods for the three species were: 5–29, usually 10–19, days for tertian; 15–50, usually 30–36, for quartan; 7–14 days for subtertian malaria; and 3–8 days for relapsing fever. Clinical manifestations were typical but rather light. Reaction to quinine was mainly good, 0·5 gm. daily being usually effective, although double this quantity had sometimes to be used, the total dose for a course being 6–8 gm. (90–120 gr). No strain of quinine-tolerant parasites was induced; when the dose has to be increased, it is attributable to some characteristic of the host, so that the action of quinine would be an indirect one. Indigenous *Anopheles maculipennis* were infected with subtertian malaria in winter time and from a person taking quinine. Reinfection with tertian malaria could be induced nine weeks after the original attack. For relapsing fever 0·45 gm. of neosalvarsan was not specific.

C. L.

DI PACE (Ignazio). **Sulla efficacia dei vari agenti di mobilizzazione ematozoaria per la diagnosi della malaria latente.** [Efficacy of Various Provocatives in Diagnosis of Latent Malaria.]—*Policlinico.* Sez. Prat. 1922. Dec. 18. Vol. 29. No. 51. pp. 1658–1660.

The work of eight years, most at least of which has already been published, is here summarized. The most effective provocatives for the lighting up of latent malaria are held to be, in order of diminishing value, the injection of nitrate of strychnine; injection of the extracts of the ductless glands, adrenal, thyroid and pituitary: and proteid shock, as induced by the injection of horse-serum, milk or antityphoid vaccine. These are held to be active agents, provided only a febrile reaction be induced; the same holding good for vaccinia.

C. L.

VIALATTE (Ch.). **Essai de coordination de quelques données relatives à la biologie des parasites du paludisme.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 341–348. With 2 charts.

Commenting on the quantity and quality of malarial literature and the antagonism between the unicists and pluralists the writer puts forward the following as established principles:—(1) There is multiplicity of morphological types comprising, in addition to the three common forms infesting man, *Plasmodium falciparum quotidianum*, Craig, 1915; *P. falciparum mitis* and *P. falciparum immitis*, Grassi and Sella, 1920; *P. tenue*, Stephens, 1914; *P. falciparum caucasicum*, Marzinowski; *P. vivax minuta*, Ahmed Emin, 1914. In addition MARCHOUX notes different geographical races. All the described species then grade into one another. (2) There is seasonal alteration of the different morphological types of such a nature that when *P. vivax* predominates *P. falciparum* lessens, and vice versa. It is a striking fact that in every country one and the same type of plasmodium predominates at the time when anopheline activity is at its greatest. (3) Cultivation of plasmodium in vitro can give different forms from those with which the tube was inoculated, so that the morphological characters which gave us the basis of classification are not fixed. (4) The plasmodia of man are not infective for animals, so that humoral reactions are evidence of specific differences greater than the morphological affinities. (5) The infective power of mosquitoes disappears during hibernation, so that the infection is carried on by man, and yet the type of plasmodium which predominates at the begining of the new cycle differs from that predominating at the end of the old one.

Practically all that is here quoted is given in italics in the original. It is not a collection of statements of fact, but of conclusions, with whose validity there is no rational need to agree.

C. L.

STEPHENS (J. W. W.). **A New Malaria Parasite of Man.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 383–388. With 1 chart in text and 1 coloured plate.

In a man who had acquired malaria in 1916 in East Africa there were observed in April and May 1918, and again on 19th and 20th July of the same year simple tertian parasites. In films taken between the 21st and 24th of that month no parasites were found. On the 28th and 29th anomalous forms appeared, and a series of films extending from the 28th July to 1st August showed that the periodicity of the parasites appeared to be tertian, a rise of temperature on 28th and 30th falling in with this suggestion. The exceptional forms possess these characters. The small rings have no special features and in stained films show no evidences of motility; they lie in red corpuscles not uncommonly oval and with irregular fimbriated margins, not enlarged, and generally without Schüffner's dots. The medium forms are non-amoeboid; pigmented, this in stained forms appearing brownish-black, and granular rather than spicular; compact, with complete absence of "straggling"; round and oval, not bandlike and meridional, although "the amount of chromatin and the distribution of the pigment in a lateral band are appearances which recall quartan." In forms with one chromatin mass this is often lateral and roughly triangular. The infested erythrocyte is so often oval that the shape is held to have actual significance. Schüffner's dots are well marked. The maximum number of merozoits appears to be 12, lying in a decolorized normal or slightly enlarged cell with Schüffner's dots. Some few of the forms, even at this stage, are indistinguishable from simple tertian parasites; a single double infection of a red corpuscle by two quarter-grown parasites was noted. No gametocytes were seen. It is noted that the parasite resembles that seen by AHMED EMIN in 1914 in six pilgrims at Camaran in the Red Sea and named "*Plasmodium vivax minuta*" [see this *Bulletin*, Vol. 4, p. 88] but, owing to an inability, on the material available, to come to a decision on the identity of the two forms, the new one is designated *P. ovale*. A plate of beautiful coloured drawings illustrates the paper.

If this parasite be a specific form and not a sport (the administration of quinine is not mentioned, so presumably it was not given), and if one hold that in the face of inability to come to a decision on the matter this form should not be separated specifically from EMIN's, then, under the Code of Zoological Nomenclature, EMIN's name would hold. For under the Code, if a subspecies be raised to specific rank, the subspecific name becomes the specific name. Under these circumstances the valid name of this parasite would be *P. minutum*, since the specific name must agree in gender with the generic.

The matter is further complicated by the fact that ZIEMANN [see this *Bulletin*, Vol. 7, p. 25] deliberately—and unjustifiably—renamed Emin's parasite *Plasmodium camarense* Emin, on the ground that EMIN's designation was descriptively inapplicable. Zoological names are, however, no more descriptive than are the often singularly inappropriate surnames of men, and when in addition, as ZIEMANN's designation implies, EMIN is cited as father of a name of whose conception he is innocent and of whose birth he is ignorant, a position is produced which is both ludicrous and confusing.

C. L.

LEGER (Marcel) & BÉDIER (E.). **Considérations sur la morphologie du *Plasmodium praecox* à propos d'un cas d'accès pernicieux.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1010–1015.

A comatose negro boy of 18 months showed on blood examination an intense infection with *Plasmodium praecox*, 40 per cent. of the erythrocytes harbouring parasites, there being 53 parasites per 100 corpuscles. In appearance 72·5 per cent. of the parasites were normal; 9·5 per cent. amoeboid, a condition increased by quinine; 4 per cent. bacilliform; 3·5 per cent. were held to be young gametocytes; 8·5 per cent. were segmenting forms with 6 to 22, generally 10 to 16, merozoits; and 2 per cent. unplaced forms. In most parasitized corpuscles Maurer's, or Stephens and Christopher's, dots were present. The child recovered under energetic quinine treatment. BALFOUR and WENYON's suggestion that these forms are prelethal, as well as STEPHENS's that they constitute the species *P. tenue*, are rejected in favour of that of MACFIE, SERGENT and CRAIG that they constitute a reaction to malarial toxins.

C. L.

BRAU (P.). **Paludisme à** *P. falciparum*. **Diagnostic et traitement.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 834–843.

When the microscope fails to reveal the malarial parasite, even after provocative treatment, the value of a large mononuclear count (including under this category all mononuclears larger than a polymorph) of 10 per cent. or over is stressed, such cases clearing up under quinine. If, however, pulmonary or renal congestion complicate the malaria, as indicated by rhonchi at the posterior base, and by albumin or casts in the urine with lumbar pain, or if there be gastric symptoms, there may be an excess of polymorphonuclear leucocytes. For treatment the administration as a routine of quinine by mouth is advised, given as follows: On the first day 2 gm. [30 gr.], on days 2, 3, 4, 8, 9, 10, 17, 18, 19, 23, 24, 25, nothing; on the other days, up to the thirty-first, 0·5 gm. of quinine hydrochloride. In the case of difficulties the value of the rectal route is emphasized, percutaneous injection being less favoured. Injections of colobiase of quinine for chronic cases, cupping of the back or loins in pulmonary and renal congestions, comprise the chief armentary; with the addition that ascariasis and taeniasis must be combated if present, ankylostomiasis being apparently considered unworthy of particular note.

C. L.

LOTKA (Alfred J.). **Contribution to the Analysis of Malaria Epidemiology. I. General Part. II. General Part (continued). Comparison of Two Formulae given by Sir Ronald Ross. III. Numerical Part.**

SHARPE (F. R.) & LOTKA (Alfred J.). **IV. Incubation Lag.**

LOTKA (Alfred J.). **V. Summary.**—*Amer. Jl. Hyg.* Baltimore. 1923. Jan. Supp. Vol. 3. pp. 1–37. With 4 figs. pp. 38–54; pp. 55–95. With 9 text figs. pp. 96–112. With 4 text figs. pp. 113–121.

If the reader will assume that an infective mosquito will bite not oftener than once, that mosquitoes which bite two or more healthy persons and then an infective person are non-existent, that the balance of unfed infective mosquitoes is the same at the beginning and end of a month, that the changes in the malaria rate are sufficiently slow, that the mean longevity of a mosquito is 10 days, that 23 per cent. of malaria cases recover monthly, that a quarter of infected human beings and one-third of infected mosquitoes are infective, that a mosquito bites a human being 0·824 times monthly, that immigrations of man and mosquitoes are absent, and if he be completely at home in the calculus, then he may profitably pursue the writer through the 120 pages and 441 equations by which, following Ross, this mathematical thesis is built up and applied to the practical problem of the incidence of malaria. The points particularly considered are malaria equilibrium, due either to absence of malaria or to the fact that new infections are just balanced by deaths and removals. Ross's conclusions are brought out, and it is shown "that the course of events, as defined by Ross's equations, is represented by a family of curves on a surface having a depression or pit, as it were, at a point of stable equilibrium, whereas unstable equilibrium corresponds to a raised point of peculiar character." Of Ross's two formulae it is concluded that that given at Sect. 66 of his book, "The Prevention of Malaria," is of more exact and more general application, while that found in Sect. 27 applies "to the particular case in which the malaria rate in the human population bears, nearly, that particular ratio to the malaria rate among mosquitoes which prevails when equilibrium is established." It is concluded, too, that the incubation lag has no effect upon the position or stability of malaria equilibrium; it merely delays its establishment.

C. L.

INGRAM-JOHNSON (R. E.). **Dengue v. Malaria.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 15. Vol. 26. No. 2. pp. 27–28.

In extending his former conclusions that dengue produces an immunity to malaria [this *Bulletin*, Vol. 19, p. 579], the writer develops the following argument. *Bacillus typhosus* undergoes, under cultivation, wonderful metamorphoses, from some of which exude clumps of almost ultra-microscopic granules. Yet from these clumps the full-sized bacillus can be reproduced. Malaria is carried by *Anopheles maculatus*, dengue by *Culex fatigans*, the germ of the latter being ultra-microscopic. The fate of the malarial parasite is established, but what happens if it be swallowed by Culex? Can it be possible that in two species so closely related the parasite should be digested in the one and not in the other? Is it not more reasonable to suppose that the malarial parasite splits up into ultra-microscopic organisms, which, on injection into the human host, produce dengue? It may be suggested in comment that the issues are not so clearly cut as the argument suggests.

C. L.

FERNBACH (H.). **Akute gelbe Leberatrophie, Malaria und Salvarsan.** [Acute Yellow Atrophy of Liver, Malaria and Salvarsan.]—*Med. Klin.* Berlin. 1922. Mar. 5. Vol. 18. No. 10. pp. 306–308.

ISAAC-KRIEGER (K.) & LÖWENBERG (W.). **Gehaüftes Auftreten von Malaria in Verbindung mit Lues und Salvarsan.** [Lighting up of Malaria by Salvarsan in Syphilis.]—*Ibid.* Aug. 6. Vol. 18. No. 32. pp. 1024–1025.

WESENER. **Ein Fall okkultur Malaria, durch Salvarsan manifest geworden.** [Case of Latent Malaria lighted up by Salvarsan.]—*Muench. Med. Woch.* 1922. Nov. 24. Vol. 69. No. 47. pp. 1626–1627.

HANEL (Günther). **Die malariaerkrankungen der Berliner Bevölkerung und der Zusammenhang mit der antiluetischen Salvarsantherapie.** [Malaria in Berlin in relation to Antisyphilitic Salvarsan Treatment.]—*Med. Klin.* 1922. Dec. 17. Vol. 18. No. 51. (No. 941.) pp. 1615–1617.

The 27 cases considered in these communications indicate the interest taken in Germany on the subject of salvarsan in malaria. It is laid down that when fever follows the administration of salvarsan an activated malaria should always be considered as the likely cause. In practice the diagnosis of malaria was not made in these cases until hospital was reached. In connexion with a death from acute yellow atrophy of the liver a grave warning is issued that the provocation of active malaria by injection of salvarsan is not to be lightly undertaken.

C. L.

ROSENBERGER (F.). **Malaria tropica unter dem Bild der Dysmenorrhoe.** [Malaria presenting Dysmenorrhoea Picture.]—*Med. Klin.* Berlin. 1922. Oct. 29. Vol. 18. No. 44. pp. 1409–1410.

GÜNTHER (B.). **Ueber einen Fall von Malaria mit einer dem Erythema nodosum ähnlichen Hautaffektion.** [Malaria Case with Skin Lesions resembling Erythema nodosum.]—*Ibid.* Nov. 12. No. 46. p. 1467.

The diagnosis of malaria in each of these cases is made upon the finding of a single parasite during the examination of a number of films. In the first case it occurred in a thin film which is stated to have contained almost no leucocytes, those present being almost exclusively lymphocytes, and was a dividing form ; a thick film was negative. In the second a single rather delicate, rather small, rather blue ring was found in a red blood corpuscle, coupled with a tertian fever disappearing under quinine, while erythema nodosum relapsed with the advent of fever.

C. L.

SINTON (J. A.). **Results of Some Experiments in the Treatment of Malaria with Alkali combined with Quinine (Preliminary Note).**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 850–856.

Citing the work of ACTON [this *Bulletin*, Vol. 19, p. 103] and MICHAELIS* that quinine is more lethal to Paramoecium and to bacteria in alkaline than in acid media, MACGILCHRIST's arguments indicating an acidosis in malaria, and war experiments showing that it successfully disinfects only a small percentage of malaria cases, SINTON notes "It would appear that some adjuvant is needed to assist quinine, is this adjuvant alkali ? " The point was tested by treating malaria cases, microscopically proved, with these two mixtures.

A.	Sod. bicarb.	.. gr. 60	Q.	Quin. sulph.	.. gr. 10
	Sod. citrat.	.. gr. 40		Acid sulph. dil.	.. ♏ 10
	Aq.	.. ad ℥ 1		Mag. sulph.	.. gr. 60
				Aq.	.. ad ℥ 1

All cases were given an ounce of magnesium sulphate before treatment, for the first day of treatment four doses of A and two of Q, and for the subsequent days three of each. Controls were given the quinine mixture at the same hour as the test cases, but the alkaline mixture was omitted. The total amount of quinine given to each case was 110 gr. The experiment took place during June, July and August on prisoners in the Lahore jail, so that, it is concluded, apparent relapses must have included a certain number of fresh infections. Cure was accepted if no parasitic relapse appeared during eight weekly examinations. Controls and test cases were taken in strict alternation.

Of 43 cases of benign tertian malaria treated with quinine and alkali, 72 per cent. were cured, of controls 60 per cent. Fever was more rapidly controlled after alkali, its average duration after the first dose being 0·27 days, as against 0·48 days in controls and 1·66, according to MACGILCHRIST, in Bengal. Similarly in a small series of cases taking cinchona febrifuge with alkali the disappearance of fever was more rapid than in a similar series in which the alkali was omitted.

---

* Dependence of Action of Quinine Alkaloids on Bacteria on Alkalinity.—*Klin. Woch.* 1922. Vol. 1. p. 321.

In malignant tertian malaria 18 cases treated with quinine and alkali showed 72 per cent of cures, while 14 taking quinine only gave 36 per cent. of cures only. In four cases showing very numerous crescents these disappeared after four days' treatment.

C. L.

NOGUE (M.) **Observation clinique de l'accès pernicieux étudié ci-dessus au point de vue bactériologique. Posologie de la quinine chez les enfants du premier âge.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1016–1017.

The interest of this paper, which has nothing to do with bacteria, but describes the recovery of a child of 22 months from a grave comatose attack of subtertian malaria in which 40 per cent. of the erythrocytes were infected, lies in the dosage of quinine adopted for such cases in Dakar. This amounted to the intramuscular injection of 1 gm. (15 gr.) daily for three days. It is held that Dr. LE DANTEC saved his own daughter of three years old by injections of 2 gm. daily continued for three days, while Dr. KERNE gives to infants 0·5 gm. on the first day, and Marcel LEGER has given 0·6 gm. daily.

C. L.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1921.** [FLETCHER (William), Acting Director, Govt. Laboratories, F.M.S.]—13 pp.

Forty-four cases of cachectic malaria classed by others than the reporter as quinine-resistant were each examined microscopically an average of 23 times during four weeks of treatment, 19 times in thin and four in thick films. During this period quinine was administered as bihydrochloride in gelatin capsules or in solution, as the sulphate in gelatin capsules, and as cinchona febrifuge in gelatin capsules. In every case the dosage was 10 gr. twice daily, and Dr. Fletcher satisfied himself personally that every dose was swallowed. Under these circumstances parasites disappeared from the blood by the fifth day, except in one case of quartan infection, in which this was delayed till one day later, and in one woman, infected with malignant tertian malaria, in whom, in spite of all treatment, parasites remained for five months. The composition of cinchona febrifuge varies in India and Java thus :—

	India	Java.
Quinine	7·40	11·5
Quinidine	22·83	5·0
Cinchonine	18·58	26·3
Cinchonidine	5·84	20·0
Uncrystallizable alkaloids, ash, etc.	45·35	37·2
	100·0	100·0

Its price is a quarter of that of quinine, but having no fixed pharmaceutical composition it is clearly liable to adulteration. The immediate effect of the febrifuge in producing disinfestation was found to be equal to that of quinine. Its permanent effect was probably equally good, although, with reinfection occurring, this was more difficult to estimate. In one case it agreed when quinine had to be discarded as producing vomiting and menorrhagia.

C. L.

SCHALK (Hermann). **Zur Frage der Chininresistenz bei Malaria tropica.** [Quinine Resistance in Malaria.]—*Deut. Med. Woch.* 1922. Oct. 20. Vol. 48. No. 42. p. 1415.

In Mesopotamia were seen four Europeans with subtertian malaria who did not react to ordinary or to increased quinine dosage, administered over periods of from three to 10 days. One had also relapsing fever and another blackwater fever. They are held to be cases of primary, not acquired resistance to quinine.

C. L.

TREUTLEIN (Adolf). **Bad Kissingen und seine Heilmittel für Blutkrankheiten (Malaria, Bleichsucht, etc.).** [Bad Kissingen and its Cure in Blood Affections (Malaria, Chlorosis, etc.).]—*Muench. Med. Woch.* 1922. Apr. 28. Vol. 69. No. 17. pp. 628–629.

Nine cases of chronic malaria were treated at Bad Kissingen with quinine by Nocht's method, baths and draughts of the hot springs, with provocative methods before and after. A month later the haemoglobin had risen from 48–80 per cent. to 95 per cent., and the red cells from 2–3 million to 4½ million, and the patients were regarded as cured. The data given are insufficient to test the statement.

A. G. B.

WHITMORE (Eugene R.). **The Action of Light in the Production of Relapse in Malaria.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 475–485.

LENZ having produced evidence that sunlight causes malaria to relapse [but see this *Bulletin* Vols. 10 and 16, pp. 157 and 355], and leaving out of consideration for the moment the question whether provocative measures induce relapses or redistribution of the parasites within the body, controlled experiments have been begun, using canaries and *Plasmodium relictum.* The effects of violet light were noted, precautions being taken to insure that it reached the skin. If it do so sufficiently, relapse of infection occurs, but the value of the feathers in protecting the bird is evidenced by the observation that at 24 inches violet light produces the same effect in two hours as it does in 15 minutes without feathers. With regard to SCHAUDINN's belief that relapse is caused by development of schizonts from gametocytes, a belief which from the biological standpoint has been shrewdly mauled [this *Bulletin*, Vol. 11, p. 22], it was pointed out by THAYER in 1897 that injection of blood containing gametocytes of malaria will not produce infection in another person, nor, in the lower animals, can the injection of gametocytes of other protoza, such as *Haemoproteus*, transmit infection.

[The evident care with which the work is proceeding should yield valuable and reliable results.]

C. L.

SINTON (J. A.). **The Situation of the Malarial Parasite in Relation to the Red Blood Corpuscle.**—*Indian Med. Gaz.* 1922. Oct. Vol. 57. No. 10. pp. 367–371. With 11 text figs.

If the malaria plasmodium be ectoparasitic on the erythrocyte, as ROWLEY-LAWSON holds, lying generally in the cupped shelter of one surface, and if the corpuscle could be made to renounce its natural form in such a way as to bring the parasite, so to speak, upon the horizon, into such a position, that is, that it could be seen in profile, the point would be capable of settlement; and a number of drawings are made illustrating the position postulated. By crenating erythrocytes with hypertonic, and ballooning them with hypotonic saline Sinton believes that he has seen these conditions in profile and *en face,* in unstained parasites, in fixed and stained parasites, and in sections of erythrocytes. In support of the suggestion it is held that the optimum habitat for an extracorpuscular parasite would be one of the concave corpuscular surfaces, where it would be protected from jolting by other parasites, and where, should it attempt to escape thence, jostling erythrocytes would rap it over the pseudopodia and keep it in its place.*

COMES (Salvatore). **Appunti di biologia malarica: Modo di nutrizione e genesi del pigmento nel parassita malarico (nota terza).**—*Arch. f. Protistenk.* 1922. Vol. 45. No. 3. pp. 401–409.

In *Plasmodium vivax* and *P. malariae,* pigment is held to be formed by the nutritive vacuole, acting under the direction of the adjacent nucleus, for the reason that the pigment is held to appear first in the region of the vacuole. In the case of *P. praecox,* in which the gametocyte only is considered, the nucleus is held to produce the pigment direct and without the intermediary of a nutritive vacuole. That the pigment may be ultimately derived from the haemoglobin of the erythrocyte is not denied.

C. L.

RADOSAVLJEVÍC (Alex). **Ueber das Komplement bei Malaria.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1923. Vol. 35. No. 5–6. pp. 429–446.

The results of 330 examinations of the blood of 40 malarial cases are tabulated in this paper. The conclusions reached are that the complement content of malarial blood is less than that of normal blood, and considerably less than that of other infectious illness of man. This diminution is effected during the pre-paroxysmal period, but whether it be due to a physical condition of the serum induced by the disruption of plasmodia and erythrocytes, or to anaphylactic shock, is undetermined.

C. L.

SERGENT (Et. & Edm.). **Étude expérimentale du paludisme des Oiseaux** (*Plasmodium relictum*). **Suite des recherches sur l'action de la quinine (XXIII^e note). Suite des essais de traitement préventif ou curatif par des produits autres que la quinine (XXIV^e note).**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 320–329; & 330–340.

i. The action of quinine on *P. relictum* was thus tested:—A. on the sporozoits: (1) The crushed thoraces of 4–6 infective culices were injected into canaries, who received, immediately afterwards, an injection of 1 mgm. of quinine. Two died intensely infected; one showed a very feeble infection ; two remained uninfected, one of these becoming heavily infected from a reinoculation. Of controls, two experienced fatal infections ; in the third infection was milder than in the corresponding quininized birds.

---

* To be dragged out of the conventional rut is often stimulating, but, when coming unwarned upon "mu" when expecting "μ," stimulus is apt to pass into shock.

(2) Two to eight infective culices were allowed to feed on each of four canaries, each of which then received an injection of 1 mgm. of quinine. All the birds experienced heavy infections.

B. on the schizonts *in vitro* : One drop of blood, containing one parasite per immersion field, was mixed with varying quantities of citrate solution and of quinine, with the results seen in the accompanying Table. The conclusion drawn is that in such instances if the dilution of quinine be increased the dosage must also be increased.

	Drops of citrate solution added.	Dose of quinine given, in milligrammes.	Effect produced
1	1	0·005	Normal infection.
2	1	0·005	,, ,,
3	1	0·005	,, ,,
4	1	0·005	,, ,,
5	1	0·075	,, ,,
6	1	0·075	No infection ; no immunity.
7	1	0·1	,, ,,
8	1	0·1	,, ,,
9	6	0·1	Normal but delayed infection.
10	6	0·1	,, ,,
11	8	0·2	Normal infection.
12	8	0·2	,, ,,
13	8	0·2	,, ,,
14	8	0·2	No infection ; relative immunity.
15	8	0·2	No infection ; no immunity.

ii. The half, sometimes the whole of the spleen of a healthy rat or canary, broken up in two or three drops of normal saline, was injected into canaries, and after an interval varying from a few minutes to 11 days they were inoculated with *P. relictum.* In one of the three cases in which canary spleen was used the infection was unaltered ; in the other two it was attenuated as compared with controls. In five of the seven cases in which rat's spleen was used the infection was unaltered ; in two it was attenuated, one showing and one not showing a relative immunity to a subsequent infection. In two cases 1 cgm. of Dausse's aqueous extract of spleen was used, without evident effect. Injection of canary spleen during the incubation period of an artificially induced infection eliminated the infection in one case without producing immunity. In the other two cases the infection was more or less controlled. Intra-peritoneal injection of asaprol, even in sublethal doses, produced no effect upon an active infection. Blood taken from a vertebrate (canary, pigeon, rat or guinea-pig) into whose peritoneal cavity quinine had been injected, had no curative effect in 11 cases, but, used as a preventive, attenuated infection in two of the birds.

C. L.

KONSULOFF (S.). [**Die Bekämpfung der Malariamücken in den Reisfeldern.** [The Control of Malaria Mosquitoes in Rice Fields.]—*Ztschr. angew. Ent.* Berlin. 1922. May. Vol. 8. No. 2. pp. 283–294. [Summarized in *Rev. Applied Entom.* 1922. Oct. Vol. 10. Ser. B. Pt. 10. pp. 193–195.]

The control of the breeding of mosquitoes in rice fields was investigated by CELLI and CASAGRANDI for Culex. Finding that the resistance of the two genera varied, Konsuloff investigated the effect of heat and drought upon the breeding of Anopheles.

A temperature of 32° C. (89·6° F.) in water affects no stage but the pupae, some of which died ; on damp earth a few of the first and second stage, and all the third stage, larvae, and some pupae died. A temperature of 35° C. (95° F.) for 24 hours in water killed all the first and second stage and some pupae; on damp earth all larvae (except two of the second stage) and some pupae died. A temperature of 37° C. (98·6° F.) for 24 hours in water killed all larvae and nearly all pupae ; for six hours on damp earth was fatal to all stages.

Desiccation for 43 hours killed all stages ; if continued for a few hours only, the second and third stages were imprisoned at the bottom when the mud was flooded ; but while the third stage larvae managed to free themselves, those of the second stage did not and were all drowned.

These experimental conditions were tested on a rice field of 300 sq. metres emptied for 48 hours in July. After flooding, a fraction of the field was examined and yielded no larvae, while 1,576 were recovered per square metre from a similar control area.

It is suggested that South Europe rice fields should be drained for the following periods :—one five-day draining in April, two four-day drainings in May and two in June, two three-day drainings in July and two in August, and two four-day drainings in September, on the ground that, larval development taking a month in these localities, each individual would be exposed twice during that period to the sun's rays.

C. L.

i. ECKSTEIN (F.). [**Die Verbreitung von *Anopheles* in Bayern und ihre mutmassliche Bedeutung für die Einschleppung der Malaria.**] [The Distribution of Anopheles in Bavaria and its Possible Bearing on the Introduction of Malaria.]—*Ztschr. angew. Ent.* Berlin. 1922. May. Vol. 8. No. 2. pp. 229–282. With 1 map. [Summarized in *Rev. Applied Entom.* 1922. Oct. Vol. 10. Ser. B. Pt. 10. pp. 192–193.]

ii. ECKSTEIN (Fritz). **Anopheles und Malaria in Bayern.** [Anopheles and Malaria in Bavaria.]—*Muench. Med. Woch.* 1923. Feb. 2. Vol. 70. No. 5. pp. 147–148.

i. Malaria has almost disappeared from Bavaria during the last 50 years, coincident with the fall of the subsoil water, the result of drainage. The chance of the occurrence of epidemic malaria is considered remote.

ii. This communication stresses the importance of cultivation in the causation of the decrease of malaria in Bavaria. But the main factor is felt to be inherent in the thermotropism of the anopheles, it being held that in the last decades stables have become warmer and dwelling rooms cooler. He refers apparently still to the last 50 years.

C. L.

SEIDELIN (H.). **Au sujet des comprimés de quinine.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 686–690.

BLANCHARD (M.). **A propos de la note de** H. SEIDELIN **" Au sujet des comprimés de quinine."**—*Ibid.* pp. 690–691.

LEGER (M.) & BÉDIER (E.). **La quinine sous forme de comprimés et son élimination par l'urine.**—*Ibid.* Nov. No. 9. pp. 870–872.

LANGERON (Maurice). **A propos des comprimés de sels de quinine.**—*Ibid.* No. 10. pp. 959–961.

Commenting upon the vivacious communication of BLANCHARD (this *Bulletin*, Vol. 19, p. 872) SEIDELIN points out that tablets are unquestionably the most convenient and popular form of administration of quinine, and one not to be lightly rejected. He selected 12 persons, divided into six pairs, the individuals in each pair being, as far as possible, of the same physical standard. To one person in each pair he gave 0·25 cgm. of hydrochloride of quinine, and to the other the same quantity in solution, and he tested the urine of each person eight times from one to 24 hours after administration. The experiment was repeated some days later, except that those who had had the tablets now had solution, and vice versa. The tables show a slightly greater excretion, and presumably a slightly greater absorption, of quinine, from the tablets than from the solution. A comparison of the excretion of euquinine taken in powder and in tablet form gave a slight advantage to the powder. The urine test was by Giemsa's and not by Tanret's reaction, namely :—Perchloride of mercury 27, water 1,500 ; potassium iodide 100, water 500 ; mix, add glacial acetic acid 20. He holds with the weekly administration of 1 gm. of quinine on two consecutive days, and adds, which is, as he points out, a personal belief, that if the dose be varied it should be with the intention of adjusting it to that dose which actual experience shows to be necessary at that time and place for the treatment of active malaria.

BLANCHARD in reply quotes from literature instances of durability of tablets which have indeed merited the pseudonym of " brickbats," and urges that the real value of the controversy lies in its drawing attention to the need of verifying the quality of tablets in use. The Society drew the attention of the Ministry of the Colonies to the matter.

LANGERON points out that the daily press has taken up this question with habitual incompetence and inopportuneness, so that the advantages laboriously gained are in danger, and all tablets are being damned by reason of the fraudulent nature of the few. Of types, there is the fragile uncoated one with its excessive bitterness, the sugar-coated type (as exemplified by the products of what is thinly veiled under the description of a great English firm), whose disintegration is in two phases, the solution of the sugar coat and the crumbling of the central mass, it being held, curiously enough, that in certain stomachs the sugar is not soluble ; and a globular pill compounded with gum and very difficult of solution, but not really a compressed drug at all. As a binding material, amidol is advised. It is pointed out that tablet medication need not be anything but satisfactory if the proper tablet be chosen.

In view of the consternation which BLANCHARD's condemnation of the quinine tablet has produced in the French Colonies LEGER and BÉDIER have repeated his experiments. BLANCHARD had examined 44 persons, found the tablets, more or less serviceable, in the faeces of 22 of them, and obtained Tanret's reaction in the urine of 5 only.

The writers report upon 145 cases, 47 Europeans and 98 natives, using four different sets of tablets of quinine hydrochloride, with one, two or three urine examinations from the third to the eighth hour. The only case in which the reaction was absent was one in which there was only a single examination four hours after administration. The result being in entire disagreement with those of BLANCHARD, obviously it is the particular tablets, of unknown origin, possessed by the latter which are at fault, and there is no justification for the general condemnation of that most convenient form of medication.

C. L.

HECKENROTH (F.). **Mesures capables d'enrayer le paludisme à Dakar.** —*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1024–1032.

A Commission appointed to consider the prevalence of malaria in Dakar, despite half a million francs spent on its attempted elimination by a programme instituted in 1901, makes the following recommendations. The public water supply, being insufficient, is intermittent, necessitating intermediate storage within or without houses: the cisterns breed anophelines: powers are required for the adequate inspection of inside cisterns. The water supply is supplemented by wells which, insufficiently protected, afford ideal breeding-grounds. The penalties for permitting stagnant water are inadequate, and the Administration is itself very lax in this matter, even providing public fountains with no means of removing the overflow. Defects in the rain-water drainage system and the distributing system for potable water produce numerous breeding-places. The real difficulty is a lack of sanitary conscience, both in Europeans and natives. A start has been made in the quininization, three times a week, of school children from May 1 to November 1. A new sanitary programme, to obtain an adequate supply of drinking water and the hygienic removal of waste water, is contemplated at a cost of a million francs.

C. L.

SERGENT (Edmond & Etienne). **Prophylaxie du paludisme. Programme sommaire d'une campagne antipaludique.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 436–443. With 1 text fig.

This mere enumeration of some 200 different matters meriting special attention during an antimalarial campaign directs attention to the complexity of such procedures.

C. L.

i. BRANDENBURG (Kurt). **Ueber späte Malariarückfälle.** [Late Malaria Relapses.]—*Med. Klin.* Berlin. 1922. Apr. 16. Vol. 18. No. 16. p. 508.

ii. VIGNES (H.). **Paludisme et gestation.**—*Jl. des Practiciens.* 1922. July 22. Vol. 36. No. 29. pp. 467–468.

iii. VON WILUCKI. **Ueber einen fraglichen Zusammenhang von Epilepsie und Malaria.** [Possible Relationship of Epilepsy to Malaria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 11. pp. 342–348.]

iv. DENTICI (S.). **[Roentgen Treatment of Malarial Spleen.]**—*Tumori.* Rome. 1922. July 25. Vol. 9. No. 1. p. 19. [Summarized in *Jl. Amer. Med. Assoc.* 1922. Oct. 14. Vol. 79. No. 16. p. 1369.

i. Three cases are noted in which malaria relapsed up to four years after infection. In one case injection of salvarsan precipitated the attack.

ii. A compilation under the following headings. Pregnancy confers no immunity against malaria, but, on the contrary, often lights up a latent infection and produces a severe attack. Malaria often causes premature delivery and severe symptoms during the puerperium. Intra-uterine foetal infection may or may not occur. Quinine should be given during pregnancy in the same doses as to the non-pregnant; FREDERICI, in 1902, published 49 malarial pregnancies all quinine-treated and all going to term except two with high fever.

iii. In 1917 an under-officer experienced an attack of malaria in which parasites of an unstated species were found. Epileptiform attacks occurred, persisting after the malaria was apparently cured. The possible causal relationship between the two is discussed at considerable length, and the conclusion is reached that an instance of "exogenous malarial epilepsy" is being dealt with.

iv. "Radiostimulation of the spleen in Chronic Malaria.—Dentici treated the large spleen with small stimulative doses of the roentgen rays in the case of a boy of 16 with chronic malaria. Then the spleen was removed, and the microscope showed unmistakable lymphoid hyperactivity."

C. L.

COULOGNER **Détermination de l'index splénique des enfants en Haute-Volta.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. p. 765.

FABBRI (G.). **La Malaria nella questione meridionale.**—Supplement to *Ann. d'Igiene.* 1922. Vol. 32. 62 pp.

FALK (J.). **Die Malaria im Kindesalter.**—*Med. Klin.* Berlin. 1922. Sept. 10. Vol. 18. No. 37. pp. 1184-1185.

GARRISON (C. W.). **Problems encountered in maintaining Urban Malaria Control.**—*Southern Med. Jl.* 1922. May. Vol. 15. No. 5. pp. 352-358.

MARCIALIS (G.). **Sulla presenza di cellule emoistioblastiche e monocitoide nella milza malarica.**—*Gaz. degli Ospedali e delle Cliniche.* 1922. Mar. 16. Vol. 43. No. 22. pp. 259-261.

PRAT (Stéphane). **Considérations sur le paludisme et sa prophylaxie.**—*Arch. Méd. et Pharm. Milit.* 1922. Sept. Vol. 77. No. 3. pp. 298-306.

ROBERTO LARDE (Carlos) & ARTHES. **Anofeles de El Salvador y profilaxia paludica.**—*An. del Depart. Nac. Hig.* Buenos Aires. 1922. Jan. & Feb. Vol. 28. No. 1. pp. 17-35.

ROBERTS (Stewart R.). **The Influence of Malaria on the Circulation.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Sept. Vol. 2. No. 5. pp. 463-474.

WILLIAMS (Ennion G.). **Rural Malaria Control with the County as the Unit.**—*Southern Med. Jl.* 1922. May. Vol. 15. No. 5. pp. 362-368.

SLEEPING SICKNESS.

DUKE (H. Lyndhurst). **An Inquiry into an Outbreak of Human Trypanosomiasis in a "*Glossina morsitans*" Belt to the East of Mwanza, Tanganyika Territory.**—*Proc. Roy. Soc.* 1923. Jan. 4. Ser. B. Vol. 94. No. B 660. pp. 250-265. With 1 map.

The author is of opinion that information collected by him during a tour in July and August, 1922, of the country east of Mwanza, Tanganyika Territory, confirms in a very striking manner the views recently stated by him regarding the importance of direct transmission in the spread of sleeping sickness [this *Bulletin*, Vol. 15, p. 377].

The population of the district exposed to fly is estimated at about 16,000. During his tour Duke palpated 539 natives from villages actually in the fly scrub; 86 had suspicious enlargement of axillary glands on one or both sides. A single fresh blood preparation was examined from each and gland punctures were made in 57 cases: in addition fresh blood examinations were made of 77 sick, treated and untreated, at the three collecting stations, and trypanosomes were found in the first twenty fields in 37 of them. The distribution of the cases among the sultanates involved in the fly country is roughly as follows, counting from the first appearance of the disease:—Itirima 200, Ntussu 180, Usmao 20, Nassa 50, Msansa Mdogo 0, Mago 0, Ututwa 0 (?). The paper is illustrated by a map.

The disease apparently made its first appearance in the Igombe group of villages in the latter part of 1920, and the question arises, where did the trypanosome come from? SWYNNERTON [see p. 311] favours the introduction of a human trypanosome from outside the belt, possibly as the result of the movement of Belgian forces during the war. Duke points out, however, that the human trypanosomes of Tanganyika and Congo are of the *gambiense* type, whereas the outbreak in question is due to *T. rhodesiense*. He considers that, as the result of the undermining of the general vitality of the population due to the desperate famine of 1919 and early months of 1920, and the consequent greatly increased severity of ankylostomiasis, the local game trypanosome, *T. brucei*, obtained a footing in man. During the famine the natives were allowed to kill game for food and, in addition, ate up their small stock of domestic animals: as a result the fly were compelled to turn to man for food.

The course of the disease is, as a rule, rapid—according to the natives 3 to 8 months from the appearance of obvious symptoms. Oedema of the dorsal surface of the foot is usually the first sign noted by relatives, but often there is a history of headache and fever a week or two before. Signs of abdominal disturbance were common, but it must be remembered that a severe form of ankylostomiasis has existed for years in the district. A remarkable feature of the infection was the presence of numbers of parasites in the peripheral blood [this, in the reviewer's experience, is the rule in *T. rhodesiense* infections.]. In all the cases seen the axillary glandular enlargement was much more pronounced than that of the cervical region.

The majority of cases came from localities where both game and fly were relatively plentiful at the time of the author's visit, and in all there was ample evidence of a relatively recent diminution in the amount of game. Contrasting SWYNNERTON'S and his own views of the situation, Duke writes as follows:—

"Swynnerton believes that a human trypanosome was introduced into the Belt from some outside infected area, and reached Igombe at a time when there was a scarcity of game in that district. The fly, which were in consequence feeding extensively on man, became infected with the new parasite, which was thus spread through the population, partly by cyclical and partly by direct transmission.

" My view is that in the Igombe area, just before the appearance of the disease, both fly and game were numerous. The game, in particular, was plentiful in comparison with other parts of the Belt. In addition, there was a number of villages right in the Fly country. The game decreased in numbers as a result of various influences, especially during 1919, and at the same time the population was weakened by famine, influenza, and ankylostomes. The disappearance of the game buffer drove the fly on to man, who was no longer in a fit state to cope with the frequent injections of *T. brucei* which he now received from the tsetse, and eventually the trypanosome obtained a footing in man."

Interesting cases are those scattered through villages which lie well outside the bush, but the inhabitants of the villages are constantly entering the bush to visit their innumerable relatives and friends and also to cultivate a certain variety of millet which is said to require bush soil. Duke agrees with SWYNNERTON that infection in these cases is always traceable to contact with a previous case. The great majority of the cases were adults, both men and women, the disease being rare in young people below fifteen and exceedingly rare in children.

The spread of the trypanosome is effected by a *morsitans*-like tsetse [*G. swynnertoni*, Austen, 1923], and of the two alternative methods by which a trypanosome can be transmitted by Glossina, Duke has no doubt that, in the present epidemic, direct transmission is by far the more important. In support of this view are :—The predilection of the fly for man, the extraordinarily insanitary condition of the villages, the presence of numerous parasites in the peripheral blood, and the fact that there are many instances of two or more individuals living in the same hut at the same time becoming infected one after the other. The spread of the disease from place to place in the immediate wake of an infected visitor points unmistakeably to direct transmission as the method of spread. The presence of infected natives in the Nduha neighbourhood, where game is absent and where flies are in consequence feeding on man, has not caused any increase in the percentage of flies carrying the polymorphic trypanosome. The author records that he and a fly-boy were on August 16, 1922, bitten by a tsetse which they believe had escaped from a box of flies captured the previous day at Nduha ; this fly they recaptured, and on examining it found the gut and salivary glands swarming with trypanosomes and a number of freshly-imbibed blood corpuscles in the anterior part of the gut. This is the first record of a fly, cyclically infected with *T. brucei*, known to bite man without producing infection, in a region where the *rhodesiense* type of organism is found in man.

The wild-fly strain and the two human strains observed all formed posterior-nuclear forms in guinea-pigs, and the parasite belongs undoubtedly to the *brucei* group.

By dissection of wild-fly the author sought to obtain, first the " game index " of the fly—that is the percentage of insects carrying trypanosomes which, in the absence of domestic stock, must have come from the blood of game ; and, secondly, to discover the distribution of the polymorphic organism. In the table in which the results are summarized the observations are grouped into three classes :—*Class A*. Flies from localities where the inhabitants are heavily infected and game and fly are both present—the latter in relatively large numbers; *Class B.* Flies from villages less heavily infected than in *A*; game scarce and fly not particularly numerous; *Class C.* Flies from places where there is game, but no people; fly fairly numerous. The figures show in a very striking manner that the presence of numerous human beings infected with "*T. rhodesiense*" is not correlated with an increase in the number of flies cyclically infected with the gut-and-gland trypanosome. The author writes:—

"It might be maintained that this percentage represents the utmost carrying capacity of wild *G. morsitans* for this group of trypanosomes. If this is the case, it is difficult to explain the situation in the Mwanza Fly-Belt save by ascribing the spread of the human strain to direct transmission.

"If *T. rhodesiense* and *T. brucei* are different species both carried cyclically by wild flies, surely the appearance of an epidemic in man would be reflected in the fly figures. Otherwise it behoves the sponsors of '*T. rhodesiense*' to include among its specific characters the entire reliance on direct transmission for its spread from man to man."

The infectivity of the game was examined by inoculating the blood from 16 of them into monkeys and by stained blood films. The blood of a roan showed a *T. vivax*-like organism, and the polymorphic *brucei* organism was recovered from the blood either of a waterbuck or a warthog, both animals having been tested on the same monkey.

The author summarizes his views on the aetiology of the epidemic as follows:—

"The ubiquitous *brucei* organism established a footing in man in 1919, or thereabouts. The conditions then obtaining were, for reasons already set forth, eminently favourable to the passage of the parasite from man to man by direct transmission.

"Cyclical transmission has played an entirely negligible part, if any, in the spread of the disease, and this for two reasons: first, the long submission of a strain to direct transmission tends to reduce its ability to survive in the fly; and, second, the newly-acquired physiological character of survival in man is lost directly the parasite is subjected to the controlling influences of the fly's interior.

"It follows logically from these conclusions that the main danger to be avoided is the presence of infected natives in communities exposed to the tsetse; and that the game, far from being a menace, serves as a valuable buffer between man and the fly.

"Experiments which are in progress at the Entebbe Laboratory promise further interesting information on direct transmission. I believe the time has now come for a comprehensive review of the position of man in relation to the mammalian trypanosomes of the African fly zones, and I propose to discuss the whole question at greater length in a paper which will appear shortly."

W. Yorke.

SWYNNERTON (C. F. M.). **The Entomological Aspects of an Outbreak of Sleeping Sickness near Mwanza, Tanganyika Territory.**—*Bull. Entom. Res.* 1923. Jan. Vol. 13. Pt. 3. pp. 317–370. With 6 plates, 1 text fig & 1 map.

Information volunteered by the native headman of Basheshi drew attention to an outbreak of sleeping sickness near Mwanza, and an investigation by MACLEAN showed that the disease was in fact trypanosomiasis. The author writes:—

"It was obviously an exceptional opportunity to gain some idea at first hand of the combination of factors necessary to bring about an outbreak of human trypanosomiasis in epidemic form before these should have been masked by remedial measures—particularly so if it should be of Nyasaland type, and, in the event, furthermore, of *T. rhodesiense* and *T. brucei* being finally shown to be conspecific."

He was especially anxious, with a view to future policy, to gain a first-hand knowledge of the probable relationship of the game to such an outbreak, and consequently proceeded to Mwanza at the beginning of May, 1922.

The country generally, as regards vegetation, is divisible primarily into (1) perfectly, or nearly perfectly, open country free from tsetse, (2) acacia wooding, infested nearly throughout by a new tsetse of the *morsitans* group [*G. swynnertoni*, Austen, 1923], and (3) *Brachystegia*, savannah forest, also fly-infested. Details are given regarding these types of country. The population can be divided firstly into cattle-keeping cultivators who live relatively thickly in the cleared areas and who, when near enough, visit the woods for various purposes, and secondly into hunting and fishing cultivators who, owing to nagana, keep no cattle and who live in a more scattered manner in the woodland area itself. A detailed account of the distribution of game within the district follows. In certain areas, particularly to the north-east, it is particularly abundant, more south and west, in the woodland areas most closely associated with the outbreak of sleeping sickness, great game animals are exceedingly rare, and a third area, which comprises the closely settled country, is nearly destitute of game and avoided by it.

The paper next deals with the various tsetse flies found in the infected area and surrounding zones. *G. swynnertoni* was the only tsetse which could be found anywhere in the known infected area, notwithstanding a most thorough search, and is the fly referred to in the present paper. *G. palpalis*, *G. brevipalpis*, *G. fusca* and *G. pallidipes* are to be found mostly in comparatively small numbers in various places around the infected area. *G. morsitans* is, so far as the author knows, the only tsetse which exists on the densely infested *Brachystegia* area to the west of the infected district.

The following sections of the report deal with the seasonal distribution and preferences in vegetation of the fly, an apparent method of concentration, the feeding habits and sex proportions of the fly, and the following distance of female flies. With regard to the last of these points, the author saw followings of a mile and a quarter on walkers, and concludes that a barrier of a mile and a half, and probably very much more, would have to be cleared to obviate the likelihood of female flies crossing it even on natives. An experiment was devised with the object of determining the range of attack across cleared ground, and the following conclusions were reached from the somewhat incomplete experiment :—

" (1) That a clearing even of 70 yards on each side of a road would afford great protection when the grass is long, but is likely to be much less useful when it is short.

" (2) That the period of long grass is probably for the fly a period of relative difficulty in finding food-animals. Here we have some slight experimental confirmation of a point to which Fiske and Duke have drawn attention.

" (3) That both sexes of this tsetse range to some extent, flying to conspicuous objects such as isolated trees and (probably) rocks at a distance of not less than 80 yards in cleared country, perhaps much more. It follows from this that no trees, however clean-stemmed, must be left in a road-clearing. Also that the high, black-green euphorbia hedges that make the villages so conspicuous may be a disadvantage when the village is within one or two hundred yards of bush."

The various types of villages found in the sleeping-sickness area are described in some detail; they fall into three classes, (1) villages completely in the bush, (2) villages in a mbuga, *e.g.*, a more compact village of several huts, much clearer and less overgrown than the previous class and standing a quarter of a mile from the bush in an open grassy mbuga, (3) villages in cleared and closely settled country.

Regarding the date of origin of the epidemic, the author believes that it probably started five or six years ago, and he notes that BALFOUR told him that he had found on April 2, 1918, unusual numbers of trypanosomes in a slide made from the blood of a patient from Usmao who had died shortly before. It was always easy to trace a sequence between any case and preceding cases. Going to see the sick and taking the sick in seem to have been the commonest sources of infection recognized by the natives. An exceptional number of cases occurred along the margins of populated areas, no doubt chiefly because it was here that the largest number of people were in contact with the fly, but it may well have been due also to the fact that game was scarcest there and the fly most dependent on man. There was no indication of new and independent infections; every case appeared traceable to contact with sick persons in the presence of tsetses. Man seemed now the sole reservoir, however the first infection arose.

With reference to the conditions under which tsetse of the *morsitans* group concentrated on man, the author states that observations here and elsewhere in the territory show that concentrations on man are caused by the relative absence of game and by nothing else. With game absent they take place in villages, along paths, on travelling parties, and at the more suitable patches of bush crossed by the paths, water-holes, streams, and particular thickets and vleis. In game country concentrations do not take place, except very temporarily or incompletely. Whatever small part may be played by the game, the author is of opinion that it is impossible to regard man as other than the chief or only reservoir in any human trypanosome infection. Sick natives spend most of their time outside the huts with healthy people working or idling around them. People drop in from neighbouring villages. The habit of stopping to exchange news—indulged in always, even on the open road—is one main factor. A second is the beer-drink, which, in great part, takes place outside the huts and in the day-time. A third meeting place is the water-hole. A fourth important factor is the caravans, and a fifth, important only on lakes and large rivers, and not concerning, as a rule, the flies of the *morsitans* group, the canoes and landing-places. Finally, there are such occupations as hoeing and threshing. People who are not very sick take part in the ordinary occupations of the community, and even the very sick lie outside near other members of the community. Famine vastly increases contact, both within a given area and as between that area and those surrounding it.

The next section deals with the relation of the game to the outbreak. The author considers this subject firstly on the hypothesis that the parasite is *T. gambiense*, and secondly, that it is *T. rhodesiense* [Duke has actually shown that it is *T. rhodesiense*, see p. 309]. On the latter assumption, the epidemic may have arisen in three ways: (*a*) it may have been introduced from outside by the movements of man in the war; (*b*) the parasite may have been present all the time as a specific trypanosome pathogenic to man, or (*c*) it may simply be a strain arising from *T. brucei* of game. The author expresses no opinion as to which of these theories is correct.

He goes on to consider what has caused the infection to grow into an epidemic in this particular place. He refers to DUKE's theory that direct transmission may play the all-important part in producing and maintaining an epidemic, and refers to his own observation that the human population in this direction was being specially and continuously attacked by Glossina as a result of previous destruction of game. Game destruction and special attacks on man have, however, taken place locally in parts of the territory in which, so far as we know, no outbreak of human trypanosomiasis has followed. Sleeping sickness was first noted at the end of the famine, and it is probable (*a*) that a trypanosome actually or potentially pathogenic to man had been introduced from one of the sources mentioned above, (*b*) that famine and hardships had lowered the resistance of the population, (*c*) that out of several localities in which this trypanosome was present and might have caused trouble had it not been for the fly-diverting, virulence-controlling presence of game, it did actually first spread and establish its full virulence in one of them.

Density of fly is not in itself a cause and density of population is unessential. It is continuous density of fly in relation to man and ready feeding that matter, and these depend entirely on the presence or absence of game.

Dealing with the question of the possibilities of spread, Swynnerton writes as follows :—

> " Tsetses alone are unlikely to spread the disease far, even if it is propagated through cyclical transmission, owing to the considerable breadth of the barrier round the main Usukuma belt. Game, on present evidence, does not seem likely to spread it, and I know at present of no great movement of game between the main Usukuma belt and the tsetse belts about it. But an infected man going out, passing through or having entered for one of the many purposes I have enumerated, may subsequently sit down and talk in a village or road-side halt in any tsetse belt in the territory, in a locality in which man is for the time being the centre of attraction for the tsetses that he was in the Simiyu area during our visit, and start a case or two or an epidemic. It is improbable that the last will come about in any place about which game is present abundantly."

The rest of the paper is concerned with various measures which are commended for dealing with the situation. The paper is illustrated by an excellent map.

[It is difficult to deal with a lengthy paper of this sort in an adequate manner in a summary of moderate length, and the report, which is of great interest, should be consulted in the original.]

W. Y.

BOYÉ. **Fonctionnement technique des secteurs de prophylaxie de la maladie du sommeil dans l'Afrique équatoriale française pendant l'année 1921.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 194–216.

The author summarizes the sleeping sickness work done during 1921 in French Equatorial Africa. The various divisions into which the Colony has been divided are dealt with separately, and in a series of tables the number of persons examined in each sub-district, or group of villages, is given, together with the number found to be infected. In the Haut-Chari division 101,195 persons were examined and 2,717 old cases and 1,801 new cases of the disease found ; the percentage infected was 4·4 and the number of deaths during the year was 429.

In the Ibenga-Motaba division, comprising a population of about 30,000 persons, 2,103 old cases and 893 new cases were discovered. In the Fort-Archambault division 227,772 persons were examined and 11,013 old cases and 1,605 new cases met with; in Djoué-Loudima division 44,606 persons were examined and 113 old cases and 688 new cases found. In the Ouham-Pende-Fafa division 46,845 persons were examined and 477 cases of the disease found; this division has come under the investigation of the Commission only since June, 1921. In Loango-Loudima division, which has been dealt with for the first time during the year in question, 13,186 persons were examined and 1,180 found to be infected. The Haut M'Bomou division was taken over by the Commission for the first time in June, 1921; 16,875 persons were examined and 2,476 found to be infected. The division of Ogooué-Bongo was examined for the first time in May, 1921; 16,953 natives were examined and 209 cases of the disease discovered. The Haut-Ogooué division is still unexplored from the point of view of sleeping sickness, but was visited in December, 1920, and in January and February, 1921. According to the natives, trypanosomiasis had made its appearance three or four years previously; in various tribes the infection varied from 10 to 50 per cent. of the population. The division came under the control of the Commission in May, 1921, but has not recently been investigated; only 4,300 persons have so far been examined and 900 cases found. In the division allotted to the Institut Pasteur of Brazzaville, 31,603 persons (including 532 Europeans) were examined and 383 old cases (including 1 European) and 474 new cases (including 1 European) were discovered. The last division is that under the Libreville laboratory, which has been established since April, 1920. Details of the work of this laboratory are given by Sicé [see below].

In all, the sleeping sickness prophylactic service of the Colony has, during 1921, examined 559,658 persons, and 18,800 old cases and 9,789 new cases were found and treated. The total number of cases is thus 28,589, *i.e.*, 5·1 per cent. of the persons examined. All the patients have been given two to five injections of atoxyl and some of them more.

W. Y.

Sicé (A.). **La trypanosomiase humaine au Gabon. Organisation du laboratoire et de la station de traitement des trypanosomés de Libreville.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 151–158. With 1 map.

In this paper the author describes the sleeping sickness campaign recently undertaken in Gabon. The laboratory was opened in the early part of the year 1920, and the first investigations concerned themselves with an examination of the native population around Libreville. The people belong to the M'Pongwée tribe; 314 men, 582 women and 856 children were examined, and less than 2 per cent. were found to be infected. Having obtained this information, the investigation was extended to the surrounding districts. Of the inhabitants of the basin of the Congo, comprising about 5,000 persons, 1,619 men, 2,013 women and 984 children were examined, and about 2 per cent. found to be infected. The population of the Ogooué basin is about 3,500, and of these 960 men, 1,001 women and 305 children were examined, and 4·07 per cent. found to be infected. About 3,400 persons inhabit the banks of the Kango and its tributaries, and of 2,454 examined 3·07 per cent. were infected. In the villages on the banks of the Temboni and Noya and their tributaries to the north of Libreville, 1,360 men, 1,730 women and 744 children were examined, but only 0·78 per cent. were infected.

In all, during 1920 and 1921, a total of 17,756 persons inhabiting the villages of the basins of the Coma and Muni were examined and 429 cases of sleeping sickness found. Details are given of the administrative measures adopted.

The paper is illustrated by a map, but it has been so reduced in reproduction that most of the names are illegible, and the map is consequently of little use to the reader.

W. Y.

JOJOT (Ch.). **Prophylaxie de la maladie du sommeil au Cameroun en 1920 et 1921.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 830–833. With 1 map.

The author describes the measures adopted against sleeping sickness during 1920–21, in the Haut Nyong division of the Cameroons. This district occupies an intermediate position between those of equatorial Africa to the south where the disease is epidemic and those to the north where it is sporadic. The division is for administrative purposes divided into three districts, viz., those of Akonolinga, of Abong M'Bang and of Doumé. Between January, 1920, and March, 1922, the three districts were examined, with the following results:—In Akonolinga, with a population of 43,930 persons, 5,615 (12 per cent.) were found to be infected; in M'Bang, of 22,165 persons, 841 (3 per cent.) were infected; and in Doumé, of 61,986 persons, 2,092 (3 per cent.) were infected. It is estimated that the total number of cases is about 10,000. All the infected were given a tally, a duplicate being deposited at the issuing office; they have been atoxylized to the extent of 0·5 gm every six days up to a total dose of 7·5 gm. The treatment was then suspended, the patient re-examined after a month, and treatment again given according to the result of the re-examination. Details are given regarding the cost of the work.

W. Y.

VELHO (Luis Baptista de Assunção). **A tripanossomose em Angola.** [Trypanosomiasis in Angola.]—*Rev. Méd. de Angola.* 1921. Nov. No. 2. pp. 7–196. With 1 map.

The first section of this paper contains a general review of human trypanosomiasis in Africa—its history, treatment, and causative agents.

The Commission had three aims in view: (1) destruction of tsetse flies; (2) treatment of infected persons; (3) protection of the non-infected. The last two objects were greatly assisted by a decree in the Belgian Congo to the effect that everyone leaving the district, irrespective of race or sex, has to submit to a medical examination for trypanosomes. Those found infected are treated and the uninfected are given a certificate. The whole population is thus examined from time to time, and anyone not in possession of a certificate (unless under treatment) is liable to be punished.

The second section is devoted to an account of the work of the Mission sent out to investigate the question of trypanosomiasis in

Angola and to institute a campaign against the disease. This work was carried out in Benguella, Dombe Grande, Lobito and Catambela. A detailed account follows, in the nature of a monthly record of the places visited, the prevalence in them of sleeping sickness, the numbers of tsetse flies found, the areas of bush cleared, the establishment of medical stations for treatment, the cost of operations, and so forth, from August, 1916, to August, 1918. Sleeping sickness is shown on the map as existing at Benguella, Lobito and Egito, all on the coast.

The third and last section gives an account of the actual campaign. This begins with a lament that where so much was expected and hoped for so little could actually be accomplished owing to the scarcity of workers. In the zone Benguella to Lobito segregation camps were established in July, 1918, for the reception of patients and their treatment by atoxyl. By the end of the following year 5,000 hectares of land had been cleared, and in a little over six months nearly 60,000 flies had been captured. As regards other districts no actual figures are mentioned, the report merely furnishing general statements as to the treatment of patients and clearing of bush.

Destruction of pupae was found to be much more arduous than the members of the expedition expected, since they were met with mostly in small tufa masses of entangled bush and climbing plants along the edges of streams, although in some instances pupae of *G. palpalis* were found 100 metres away from any water.

The report gives ample evidence of strenuous work carried out under adverse conditions, but ends undauntedly by expressing hopes of greater success in the future.

H. Harold Scott.

MACKENZIE (A. J.). **Case of Trypanosomiasis.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 457–458. With 2 charts.

An account is given of a case of sleeping sickness in a young European woman about 18 years of age. The infection was contracted in the Sebungwe district of Southern Rhodesia in August, 1919. The infection, which was resistant to galyl, soamin and tartar emetic, ran a rapidly fatal course, and the patient died on December 9, 1919. On inoculation of the blood into a rabbit, the infection was shown to be *T. rhodesiense.* The case appears to be of special interest in the following points :—

1. Trypanosomes in the blood of the patient were very numerous and posterior nuclear forms were found among them.

2. In November the patient developed keratitis in both eyes, and within a fortnight became almost completely blind.

[So far as the reviewer is aware, posterior nuclear forms have never been found before in human blood, nor has interstitial keratitis been observed in human beings suffering from trypanosomiasis.]

W. Y.

KLEINE (F. K.) & FISCHER (W.). **Bericht über die Prüfung von "Bayer 205" in Afrika.** [Report on the Use of "Bayer 205" in Africa.]—*Deut. Med. Woch.* 1922. Dec. 22. Vol. 48. No. 51 pp. 1693–1696.

The observations recorded in this report, which is dated May 20, 1922, were made in the vicinity of Ndombo, about 50 miles north of Mpika, in North-Eastern Rhodesia—a region in which numerous *Glossina morsitans* are found.

The authors had three main objects in view: (1) to test the value of the drug on cases of sleeping sickness in man; (2) to test its value on trypanosomiasis of cattle; and (3) to examine its value as a prophylactic. They further decided to ascertain whether infected tsetse flies would lose their infection when fed repeatedly on animals treated with "Bayer 205," and if this were not the case, whether the development of the infection in flies in which it had already begun would be interrupted by feeding on treated animals, so that the insects did not become infective.

There exist in Africa many regions rendered useless for cattle rearing solely from the fact that they are surrounded by "fly belts," so that it is impossible to introduce animals to improve the breed or to remove them for sale. In this case it is only necessary to be in a position to protect the animals for a given period. The authors recall that some time ago they drove five donkeys from Lake Victoria through a fly belt to Tanganyika; three of the animals were given daily arsenic in the food, the others served as controls. On arriving at Tanganyika none had become infected; consequently the experiment was prolonged in a fly belt, with the result that all became infected. From this it follows that arsenic in the doses used by the authors is not an efficient prophylactic, and, further, that animals which traverse a fly belt without becoming infected are not for that reason necessarily protected against nagana, but are fortuitously bitten by no infective fly.

In order to test accurately the prophylactic value of "Bayer 205," it would be necessary to use many treated animals and many controls, and such an experiment was not possible—apart from the cost—owing to the general absence of cattle in the tsetse region. Instead, therefore, of driving their experimental animals—donkeys, cattle, dogs, goats, etc.—into a fly belt, the authors decided to feed on them many hundreds of captured *G. morsitans*, thus rendering the occurrence of infection independent of the element of chance. By this method few animals were needed, and it was possible to study more exactly the duration of the protective action of the drug. The therapy experiments were conducted in a similar manner, *i.e.*, on animals infected by the bites of captured Glossina.

As the tsetse fly experiments consumed much time, numerous preliminary and complementary experiments were performed in which the animals were infected not from tsetse, but by inoculation of the blood of naturally infected animals or strains which had passed through but few vertebrate hosts. The biological characters of such strains, the authors hold, are not changed as are those preserved for prolonged periods by passage through vertebrates in European laboratories. The parasites used were *T. brucei*, *T. rhodesiense*, *T. bovis* (perhaps identical with *T. vivax* and *T. cazalboui*) and *T. caprae*. The authors remark that *T. brucei* is the cause of nagana and *T. rhodesiense* the cause of human disease, and that up to the present, in view of TAUTE's work, they cannot consider them identical.

In their experiments the authors used chiefly monkeys (*Cercopith. rufov.*), which are extremely susceptible to *T. rhodesiense* and *T. brucei*, but which in nature are practically never found to be infected except in regions where tsetse swarms.

Experiments on monkeys.

It was found that after early administration of 0·25 gm. of "Bayer 205," trypanosomes disappeared from the blood within 48 hours. Sometimes a single dose resulted in a definite cure. Of seven monkeys which received the above dose on each of two consecutive days, a relapse occurred in three cases; of seven others which received the same dose on three or four successive days, no relapse was observed within an observation period of four months. Equally successful results were obtained by subcutaneous injection of 0·05 to 0·15 gm. Twenty-seven monkeys were thus treated, and three of them which had been infected some time and the blood of which contained numerous trypanosomes died the day after injection, a result which the authors attributed to toxaemia from destroyed trypanosomes.

The prophylactic action of an oral dose of 0·25 gm. is short, not lasting more than two days; that of a similar dose on each of two consecutive days lasts, as a rule, about four days. Naturally, the length of the protection depends also on the body weight of the animal. For practical purposes the protection is too short; for example, one monkey on which, in the course of 14 days, 480 flies were fed, became infected, although it received 0·25 gm. of the drug orally on each of four successive days before the feeding began, and a similar dose on each fourth day during the experiment. Another similar experiment gave the same results.

After the subcutaneous administration of 0·15 gm. of the drug, 854 flies were fed on a monkey between January 25 and February 3 without infection resulting. The Glossina were first fed for two days on a dog and then for two days on the treated animal, and then for two days on a second monkey; the experiment was stopped as soon as the dog and the second monkey became infected, thus ensuring that an infected fly was among those used. In later experiments only one control was used, the flies being first fed on the treated animal and then on the control. The protection resulting from subcutaneous injection of the drug is of considerable length, one monkey not being infected by the bites of 276 flies a month after treatment, and a second not being infected by 270 flies two months after treatment.

Similar observations are being made with virulent blood.

This extraordinary difference between oral and subcutaneous administration of the drug the authors explain on the hypothesis that after subcutaneous administration the drug forms a depot and is only gradually brought into action. In therapy care will have to be taken that this depot formation does not result in damage to the internal organs (fatty degeneration of the liver, nephritis and haemorrhage from the intestinal mucous membranes).

Monkeys which, on account of an oral dose of "Bayer 205," are protected against *T. rhodesiense* or *T. brucei* for a few days exhibit a relative immunity to later inoculations of the same, or different, trypanosomes. Up to the present, eight monkeys, during a period of three months, have received several injections of infective blood; two became ill after the third injection and four after the fourth, the remaining animal is still healthy. This is due to an active immunity resulting from the overcoming of a slight injection. The authors consider it very doubtful whether such relative immunity has any practical significance for the campaign against trypanosome diseases, *e.g.*, nagana in cattle.

Experiments are recorded which suggest that the trypanosomes may become accustomed to the drug. Two monkeys which had relapsed after administration of 0·25 gm. orally were given a course of treatment consisting of 0·2 gm. orally on each of four successive days—a treatment which had previously never failed; both animals, however, relapsed after a short period.

Experiments on cattle.

The next portion of the report deals with experiments on cattle. For subcutaneous administration 2–3 gm. of the drug were dissolved in 20 cc. of physiological salt solution and the injection was made under the skin close to the vertebral column. Sometimes an oedematous swelling was noted, but abscesses did not occur.

A Glossina-infected small ox was given subcutaneously, from April 5–7, 7·5 gm. of "Bayer 205" in doses of 2·5 gm. From April 23 onwards its blood was injected into monkeys every 14 days in order to see whether it was free from *T. brucei*; the monkey inoculated on May 8 became infected. Another Glossina-infected small ox received 12 gm. of "Bayer 205" in doses of 2–3 gm. between March 8 and 24; the monkey inoculated from it on April 28 became infected. A third similarly infected small ox was given 14 gm. between March 14 and 25, in doses of 2–3 gm. Up to the time of writing, none of the sub-inoculated monkeys had become infected.

A description of a number of prophylactic experiments follows:— Two small oxen were given orally, from February 1–4, daily doses of 5 gm. (total 20 gm.): on February 6 they were inoculated from a tsetse-infected dog; and on February 9 and 10, and also on February 15 and 16, they were given further 5 gm. doses of the drug: both animals became infected.

A calf was given, on January 10, 5 gm. of the drug subcutaneously, and 14 days later inoculated with the blood of a tsetse-infected dog: the animal remained healthy. The same calf was later, on March 11 and 12, given daily 2 gm. of the drug subcutaneously; from April 12–19, 852 Glossina were fed on it; on May 1 its blood infected a monkey. An ox was given subcutaneously 2 gm. on March 12 and 14, and 3 gm on March 21 and 22—in all 10 gm. of the drug; in the intermediate period, March 14–22, 756 tsetse were fed on it: the control dog became infected, but none of the monkeys inoculated from the ox has yet become infected. Another ox received 2 gm. on March 12 and 14, and 3 gm. on March 21 and 22—in all 10 gm. of the drug; from March 22 to April 2, 648 flies were fed on it; the control dog became infected but none of the subinoculated monkeys. On May 12 the ox suddenly died from unknown cause; 30 cc. of its blood inoculated into four monkeys did not produce infection.

From these few therapeutic experiments it appears that cattle are not so easily cured as monkeys; the hope that cattle can be successfully treated by a few moderately large doses following shortly on one another seems to be but slight. It is intended to determine the effects of longer courses of treatment. The authors remark that, although in the prophylactic experiments the two oxen which received large doses of the drug shortly before infected fly were fed on them have, so far, remained healthy, it is quite possible that an infection has actually occurred and is only prevented from developing by the presence of the drug; further subinoculations will decide this.

The next portion of the report relates to trypanosomes, other than *T. brucei*, found in cattle. A parasite similar to *T. bovis* was found in the blood of a number of treated animals. Possibly this is identical with *T. vivax*, but it differs in certain respects from ZEEMANN's description of the latter. This trypanosome reacts to "Bayer 205" differently from *T. brucei* and *T. rhodesiense*; in eight cases it disappeared from the blood for at most nine days after the usual dose of the drug. Its development [like that of *T. vivax*] in Glossina takes place entirely in the proboscis. Details of two experiments on goats are given which indicate that *T. caprae*—a common parasite of goats and sheep [resembling closely *T. vivax*]—is likewise relatively resistant to the action of the drug.

Regarding the question whether Glossina which have been fed on an animal previously treated with " Bayer 205 " lose their infectivity, the authors point out that certain of the experiments already described show that this is not the case : this is not surprising considering that the infective stage of *T. gambiense*, *T. rhodesiense* and *T. brucei* is in the salivary glands. The further question, however, is whether the intestinal development is influenced. The solution of this problem has, as yet, not been obtained, as it will involve the use of many laboratory-bred flies.

The final section of the report deals with the treatment of sleeping sickness in human beings. So far only six cases, found by KINGHORN, are available, but others will be sought in the Lundazi district. Details of the cases treated are as follows :—

1. A European (F. M.), 48 years old, became ill on December 10, 1921, and was first seen by the authors on January 14, 1922: the blood contained numerous trypanosomes, but there was no glandular enlargement. " Bayer 205," 1 gm., was given by the mouth on January 14, and 1 gm. morning and evening on January 15 and 16. On January 17 the trypanosomes had disappeared from the blood : the patient was given 1·2 gm. intravenously: on January 19 the urine contained a trace of albumen, but no casts: on January 24, 1 gm. of the drug was given intravenously. The patient rapidly improved, the temperature was normal, and the urine free from albumen. The patient left the camp on January 27, and after a further 14 days was given another 2 gm. of the drug. Whether a relapse has occurred is as yet unknown.

2. Pitala, ♂, aged 26, was brought to the camp on February 20 in a very weak condition; he had irregular fever, and numerous trypanosomes were found in the blood. On February 21 he was given 1 gm. of the drug orally, and on February 22 and 23, 2 gm. orally : trypanosomes did not disappear completely from the blood. On February 28 and March 3, 0·5 gm. was given subcutaneously: trypanosomes disappeared but were found again on March 18. On March 20, 1 gm. was given subcutaneously; on March 23, 1·5 gm.; and on April 8, 1 gm.: the trypanosomes disappeared on, and have not reappeared since, March 21. On March 24 albuminuria developed, but no casts were seen : the weight had increased, and the general condition so greatly improved that on April 29 the patient was, at his request, given work at the camp.

3. Yatula, ♀ aged 30, who had been ill since November, 1921, came to the camp with the previous case and was treated orally in a similar way, with the result that trypanosomes disappeared from the blood for five days. From March 2–4, 0·5 gm. of the drug was given subcutaneously; on March 21, 1·2 gm.; and on March 24, 1·5 gm. was again given subcutaneously. Since February 24 there had been albuminuria, but no casts. The blood has been free from trypanosomes and the patient completely well since March 3.

4. Chimuwira, ♂, aged 40, had been ill, according to KINGHORN, from November, 1920; there was some enlargement of the lymphatics. On March 24 and 27 he was given 1·5 gm. of " Bayer 205 " subcutaneously: albuminuria has been present since April 5. Since March 25 the blood has been free from trypanosomes, the enlargement of the glands has disappeared, and the patient looks well: he was taken on as a worker at the camp on May 1.

5. Iseke, ♂, aged 15, was very ill and could hardly walk when he came to the camp: there was slight ascites and a trace of albumen in the urine; pulse 127. On March 25 he had 1·5 gm. subcutaneously, and on March 29 and April 14, 1 gm. subcutaneously. There was a rapid and marked improvement; the urine still contains traces of albumen. Trypanosomes have been absent from the blood since March 26, and on May 1 the patient was given work at the camp.

6. Chizilicho, ♂, aged 24, had been ill since September, 1921. The cervical glands were enlarged and the appearance was apathetic. On May 10 and 16, 1·5 gm. of " Bayer 205 " was given subcutaneously: there was a marked febrile reaction and albuminuria developed. Even by March 16 the lymphatic glands had shrunken, and since May 11 the blood has been negative. In view of the severity of the case another injection of 1·5 gm. was given during the first part of June.

The authors recommend that in the treatment of sleeping sickness two or three additional injections of 1–1·5 gm. should be given at long intervals. Smaller doses are to be avoided for fear they should result in the production of drug-fast strains.

In conclusion the authors state that " Bayer 205 " exerts a pronounced influence on those trypanosomes of man and stock which undergo their final development in the salivary glands of Glossina; the intensity of the action varies with the trypanosome strain, but especially with the vertebrate host.

W. Y.

KLEINE (F. K.) & FISCHER (W.). [**Further Experiences with the Use of " Bayer 205."**] [MSS. received from Colonial Office.]

Of the six patients referred to in the previous report, five are still in excellent health, with the urine free from albumen, whilst the sixth—the European who had only two intravenous injections—has relapsed.

At the end of June, 1922, the treatment of 30 other cases was begun; 16 of them were gravely ill (marked somnolence and inability to walk). All were given an injection of " Bayer 205 " as soon as they were discovered and then conveyed to the camp, some ten days' journey away. An old woman died of pneumonia and a middle-aged man died suddenly from unknown cause seven days after the fourth injection. The remaining cases showed within a few weeks such an amelioration as to call to mind " Biblical cures." The blood has remained free from trypanosomes. At the end of August lumbar punctures were made in 19 cases (nine previously severely affected, five of medium severity, and five slightly affected), and isolated trypanosomes were found in seven of them. In all cases in which trypanosomes were found the individuals had severe nervous symptoms at the beginning of treatment. These symptoms have almost entirely disappeared, a sign that " Bayer 205 " is not without effect on the parasites in the brain. In October lumbar punctures were again made in four of the above positive cases and trypanosomes found in three of them; the patients seemed well, however, and were able to do heavy work. It is assumed that trypanosomes undergo a great decrease of virulence in those parts of the body where they are not entirely destroyed by the drug. Experimental work with cattle and monkeys seems to support this hypothesis.

The routine method of treatment adopted is as follows :—

A subcutaneous injection of 1·2 gm. of the drug in 5 cc. of warm physiological saline is given near the spine between the shoulder blades ; the injection is repeated after an interval of 10 days, and again after a further 18 days. Abscesses did not occur. It is proposed to use intravenous injections in cases where the parasites do not disappear from the cerebrospinal fluid.

The authors point out that the results appear less favourable than they really are, because, owing to the objection of the native to lumbar puncture, this was not performed in the case of patients " whose excellent state of health or independent nature caused us to fear their sudden departure."

In conclusion Kleine and Fischer state that they are not particularly satisfied with the results hitherto obtained by them in the prophylaxis and therapy of infected cattle ; they are not comparable with those achieved in sleeping sickness. The alteration of virulence caused by " Bayer 205" makes it possible, however, that treated cattle may be healthy clinically, even though they still actually harbour trypanosomes.

W. Y.

LOW (George C.) & MANSON-BAHR (Philip). **Preliminary Note on the Therapeutic Action of Bayer "205" in Nine Cases of Human Trypanosomiasis.**—*Lancet.* 1922. Dec. 16. pp. 1265–1267.

A record is given of nine cases of sleeping sickness (eight of *T. gambiense* and one of *T. rhodesiense*) treated with " Bayer 205." One of the cases died of cerebral trypanosomiasis, seven are now in good health and apparently cured, while in the last, the Rhodesian case, though greatly improved after massive injections of the drug, the result may be said to be inconclusive.

The following suggestions are put forward with reference to the administration of the drug :—

" (1) The injection is best made intravenously in the dose of 1 g. at a time, but it may also be given with safety by the subcutaneous route ; it has been suggested, too, that in cases of cerebral involvement it may be injected intrathecally. (2) The individual dose should be 1 g. at a time in a 10 per cent. solution, but we have also given it with apparent safety in 2 g. doses in a 20 per cent. solution. (3) In order to kill off all the trypanosomes more than one or two injections of the drug are necessary ; these should be given at stated intervals—once a week ; sometimes it appears that 10 are sufficient, but this cannot be taken as an invariable rule ; much seems to depend upon the severity of the infection, and, it may be, upon the location of the trypanosomes in the body. At any rate, the rôle of this drug in the treatment of sleeping sickness may be analogous to that of salvarsan in syphilis, in which disease it is now well recognized that it is quite impossible to forecast how many injections are necessary to eradicate a given infection ; more especially is this the case when the spirochaete has invaded the central nervous system. It will be readily understood, therefore, that " 205 " may fail to act in the same manner when the trypanosomes have invaded the brain substance. (4) It is probably more scientific to attempt a " *therapia magna sterilisans* " by giving the first three injections on three consecutive days. (5) Further experience is required with reference to the cumulative action of this drug in man ; its selective action upon the specialized renal epithelium requires explanation."

The opinion is expressed that " Bayer 205," although not infallible, is by far the most powerful trypanocidal substance hitherto employed.

The ideal aimed at—a *therapia sterilisans magna* resulting from one massive injection, and which HAENDEL and JOETTEN and others obtained by treating rats with " Bayer 205 "—has not, so far, resulted in man, at any rate not in the cases under the authors' charge.

W. Y.

STEPHENS (J. W. W.) & YORKE (W.). **A Case of Sleeping Sickness** (*T. gambiense*) **treated by " Bayer 205."**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 421–424.

Details are given of the treatment of a case of sleeping sickness contracted at Wamba, N. Nigeria, in August, 1921. The disease had remained untreated until the patient's arrival in Liverpool in March, 1922. Two injections of atoxyl and two of novarsenobillon were given, with the result that the general condition of the patient rapidly improved. A relapse, however, occurred in May, and the patient was then treated with " Bayer 205 "—0·5 gm. on May 30, 1 gm. on June 1, and 1·5 gm. on June 3. All symptoms rapidly disappeared and the blood became negative. On June 27 a further injection of 1 gm. was given as a " prophylactic " measure. The patient has remained well and the blood negative up to the time of writing, November 20, 1922.

W. Y.

MENK (W.). **Zur Behandlung der afrikanischen Schlafkrankheit mit " Bayer 205."** [The Treatment of African Sleeping Sickness by " Bayer 205."]—*Muench. Med. Woch.* 1923. Jan. 5. Vol. 70. No. 1. pp. 18–19.

The patient (K. F.) contracted sleeping sickness in Portuguese Africa, and trypanosomes were first found on August 12, 1922. Up to the time of his arrival at Hamburg, he had received only a couple of injections of atoxyl. On examination at Hamburg, the general condition was miserable, there was marked pulmonary tuberculosis, considerable adenitis, enlargement of the spleen and anaemia, and numerous trypanosomes were found in the blood. " Bayer 205 " was given intravenously as follows: September 26, 0·5 gm.; September 27 and 28, 1 gm.; October 4, October 12 and October 25, 1 gm.; *i.e.*, 5·5 gm. of the drug in a month. This treatment was well tolerated; it was followed by slight albuminuria, but no oedema; the first two injections were, however, followed by a considerable febrile reaction. Trypanosomes speedily disappeared from the blood, and the temperature became normal. Twelve days later the temperature rose again and *P. falciparum* was found in the blood; the malaria was treated by quinine, the parasites soon disappeared, and the spleen quickly diminished in size.

In order to ascertain whether " Bayer 205 " appeared in the cerebrospinal fluid, a lumbar puncture was made 36 hours after the third injection. The fluid was normal in appearance and did not contain trypanosomes; the presence of the drug in it could, however, not be demonstrated, as the fluid exerted no therapeutic effect on caderas mice. The author is consequently of opinion that intralumbar injection of the drug is indicated in cases where the spinal fluid is invaded.

W. Y.

MAYER (Martin). **Ueber das neue Trypanosomenheilmittel " Bayer 205 " und seine Bedeutung für die chemotherapeutische Forschung.** [The New Trypanosomiasis Remedy, " Bayer 205," and its Significance for Chemotherapeutic Research.]—*Deut. Med. Woch.* 1922. Oct. 6. Vol. 48. No. 40. pp. 1335–1337.

In this address Mayer summarizes the work which has so far been done on the treatment of trypanosome diseases of man and stock by " Bayer 205." It contains nothing which has not already been noted in this *Bulletin.*

W. Y.

HESSELBACH (Kurt). **Die trypanozide Wirkung von Bayer 205 auf** *Trypanosoma equiperdum.* [The Trypanocidal Action of " Bayer 205" on *T. equiperdum.*]—*Cent. f. Bakt.* 1 Abt. Orig. 1922. Nov. 18. Vol. 89. No. 4–5. pp. 48–71. With 1 plate & 1 text fig.

The experiments described in this paper are of three kinds, viz. :—

1. Experiments performed with the object of ascertaining the action of " Bayer 205 " on *T. equiperdum, in vitro.*

2. Therapeutic experiments on guinea-pigs infected with *T. equiperdum.* Four animals of approximately equal weight (about 300 gm.) received respectively 0·02 gm., 0·04 gm., 0·06 gm. and 0·08 gm. of the drug, and the condition of the parasites was studied in fresh and stained blood preparations made at half-hourly intervals.

3. Prophylactic experiments on guinea-pigs previously treated with the drug. Four animals of about the same weight were given 0·04 gm. of the drug and were inoculated intraperitoneally with *T. equiperdum,* respectively, 1, 3, 6 and 10 days later. The condition of the parasites in the peritoneal cavity was studied at hourly intervals, a drop of peritoneal fluid being withdrawn for the purpose by means of a capillary tube.

The harmful action of " Bayer 205 " on trypanosomes *in vitro* is seen especially in high concentrations. With 1 per cent. solutions it is slight, in 2–5 per cent. concentrations it is quite definite, whilst with 10 per cent. solutions the trypanosomes are rendered motionless within five minutes. These results have an application for the treatment of large animals, and suggest that for this purpose as large doses as possible should be employed.

In the therapeutic experiments the deleterious effect of the drug is first manifest by a sort of stimulant action ; the parasites commence to divide, but the process is not completed. Frequently parasites are seen with double blepharoplasts, but there is rarely division of the nucleus, and still less rarely of the cytoplasm ; the drug interrupts the biological processes of the parasites.

The corresponding morphological changes can be studied in Giemsa-stained preparations, and consist in profound degenerative changes in the parasites. The nucleus appears completely structureless, and in advanced degenerative stages completely destroyed, its chromatin constituent being scattered through the entire body of the trypanosome. In therapeutic experiments it is found that these changes increase with the concentration of the solutions used. Finally, the changes affect the whole body of the parasite ; the flagellum is paralysed, the undulating membrane exhibits changes, the trypanosome swells and finally disintegrates.

None of the guinea-pigs previously treated with "Bayer 205" became infected.

The changes seen in the parasites were different from those observed in the therapeutic experiments. The trypanolytic changes set in immediately and were not preceded by the biological stimulation indicated by increased divisional activity. The parasites became narrower instead of swelling, the movement of the flagellum and undulating membrane became modified, the parasites trembling or quivering. Later, the trypanocidal changes became more marked, the parasites swelled, the flagellum was lost, and finally disintegration occurred.

W. Y.

MIGONE (L. E.) & OSUNA (T.). **Behandlung des "Mal de caderas" der Pferde mit dem neuen Mittel "Bayer 205."** [Treatment of Mal de Caderas of Horses with "Bayer 205."]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Nov. Vol. 26. No. 10. pp. 289-304.

In this paper the authors record the effect of treating with "Bayer 205" a large number of horses suffering from mal de caderas. In almost every case the result was successful. In other cases the drug was used as a prophylactic agent, and here again the experiments were attended with a great measure of success, although the observations have not been sufficiently extended to determine the length of time for which a dose of the drug will afford protection.

It was found better to administer the drug intravenously than subcutaneously, as the latter method gave rise to inflammatory changes. The curative course consisted of three injections of respectively 2 gm., 3 gm. and 4 gm. given at intervals of a week. A 10 per cent. solution was made in 0·75 per cent. salt solution.

The authors state that amongst the questions still requiring an answer are :—

(1) For what period does a prophylactic injection confer immunity ? (2) What is the most suitable dose for prophylactic purposes—2 gm., 3 gm. or 4 gm. ? (3) Are the three doses necessary in order to obtain a cure ? (4) Has the serum of a cured animal a therapeutic or prophylactic action for other animals of the same species?

W. Y.

BAERMANN (G.). **Die Behandlung der Surra mit "Bayer 205."** [The Treatment of Surra with "Bayer 205."]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. Beiheft No. 2. pp. 73-123.

Surra is endemic in the Malay Archipelago, and in many districts is so severe that the large domestic animals—horses, cattle, buffaloes and dogs—cannot be kept, or only with very great losses. Every now and again great epidemics occur. The disease may be acute, subacute or chronic—acute especially in horses and dogs and chronic in cattle and buffaloes.

In the earlier experiments, the author tested the action of the drug on infected guinea-pigs and rabbits with very successful results. Details are given of nine infected horses which were given intravenously either a single dose of the drug varying from 5 gm. to 10 gm., or three to five doses at short intervals, the total of which equalled 8 gm. to 25 gm. All the animals were apparently quickly cured and did not relapse within the observation period, which varied from about 2–11 months. There follows a record of five horses which were unsuccessfully treated. In three horses an injection of the drug varying from 2 gm. to 6 gm. was given and the animals after varying intervals were inoculated with virulent blood ; in this way protection was shown to be conferred for at least 30–42 days. Other experiments are also described relating to the treatment of naturally infected horses, buffaloes and cattle.

As a result of his work, the author is of opinion that the action of "Bayer 205" on surra is very promising. A final decision cannot yet be given. All the animals were not cured, but success in 50 to 75 per cent. of cases is a considerable achievement.

W. Y.

LEFROU (G.) & OUZILLEAU (F.). **Essai du tryparsamide dans le traitement de la maladie du sommeil.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 802–805.

Reference is made to the work of Dr. Louise PEARCE, of the Rockefeller Institute, on the treatment of sleeping sickness by tryparsamide [this *Bulletin*, Vol. 19, p. 136]. On her return to America, Dr. PEARCE sent some of the drug to Brazzaville, and the authors have examined its therapeutic value on a number of cases of the disease. PEARCE found that in the first stage of the disease single doses of from 0·3 gm. to 7 gm. caused disappearance of the trypanosomes from the peripheral blood within 24 hours and that parasites did not reappear for 3–6 weeks. With repeated doses (4–7) of 2 gm. to 7 gm. given at intervals of a week the action was very satisfactory, but the observation period is as yet too short to draw definite conclusions. In the second stage of the disease, a series of injections caused amelioration, but, unfortunately, Dr. PEARCE noted visual troubles in advanced cases.

The authors had in view the possibility of using the drug as a prophylactic cure in the bush and examined the duration of the sterilization produced by a single intravenous and subcutaneous injection. Details are given of five cases so treated. The conclusions are that intravenous administration results in a shorter sterilization than subcutaneous administration. By the latter method 2 gm. caused in one case sterilization lasting a year and 1 gm. in another case a sterilization lasting 84 days. Unfortunately, 2 gm. appear to be the maximum dose which can be given subcutaneously, as larger doses produce painful inflammatory reactions.

W. Y.

CLAPIER (P.). **Premiers essais au Gabon de l'acide oxyaminophénylarsinique (Sel de Soude ou 189), dans la trypanosomiase humaine.** —*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 729–755.

The therapeutic value of oxyaminophenylarsenic acid, "189", was examined in a series of cases of sleeping sickness which had not previously been subjected to any other treatment. In 17 cases the drug was given subcutaneously or intramuscularly, in three orally, and in one intravenously.

It was found that doses of 0·02 gm. to 0·04 gm. per kilo of "189" given subcutaneously or intramuscularly caused the disappearance of the trypanosomes from the peripheral blood and gland-juice within

10–20 hours of the first injection. Intermittent treatment for 3–4 weeks produced a sterilization lasting four weeks or more after the last injection. Even, however, after repetition of large doses relapses were frequent in patients in whom the meninges were involved. They were also noted in cases in the first stage of the disease, but were of much rarer occurrence, and in these "189" gave good clinical results with rapid retrogression of the principal symptoms.

Comparing the action of the drug with that of atoxyl, it was found :—

1. That "189" produced more rapid sterilization of the blood and gland-juice.
2. That fewer injections of "189" gave long sterilization.
3. Repetition of large doses of "189" is less dangerous than massive doses of atoxyl, but toxic troubles may occur and its use over prolonged periods must be attended with care.
4. Atoxyl, even though it is inconstant in its effects, appeared to act more profoundly than "189", especially if it be associated with tartar emetic.

Only a single observation was made on a late case of the disease; in this case it was also observed that the trypanosomes disappeared rapidly (within 7 hours) from the blood and gland-juice. The drug proved inactive when given in massive doses per os.

W. Y.

BLANCHARD (M.) & LEFROU (G.). **Le traitement de la maladie du sommeil par le "189."**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 797–802.

The authors have tested the value of the sodium salt of oxyaminophenylarsenic acid, "189," on cases of sleeping sickness; the salt contains 25 per cent. of arsenic. Three cases in the first stage of the disease were given respectively a single dose of 1 gm. intravenously, 1 gm. subcutaneously and 2 gm. subcutaneously. Peripheral sterilization was obtained in 24 hours; the first case relapsed in 37 days, the second in 19 days, and the third remained free for 7 months. Six patients in the first stage of the disease were treated by six subcutaneous injections at weekly intervals, the total dose given being 8·5–10 gm. per case; no relapse was observed in 3–7 months. The drug had no action when given by the mouth and none when given to cases in the second stage of the disease.

W. Y.

NAVARRO MARTIN (A.) & STÉFANOPOULO (G. J.). **Action de l'aminophénolarsinate de soude (189) sur les trypanosomiases expérimentales du cobaye.**—*Ann. Inst. Pasteur.* 1922. Aug. Vol. 36. No. 8. pp. 619–623.

In continuation of the work of NAVARRO [this *Bulletin*, Vol. 19, p. 512], the authors examined the action of "189" on guinea-pigs experimentally infected with *T. brucei* and *T. gambiense.*

The conclusions are :—

Aminophenylarsenate of sodium ("189") exerts an energetic curative effect on guinea-pigs infected with *T. brucei* and *T. gambiense.*

The chemotherapeutic coefficient is much more favourable than those which have been observed with any other known derivative of arsenic.

Subcutaneous injections of aqueous solutions (10 per cent.) of the drug are perfectly tolerated and do not provoke any local reaction.

W. Y.

FOURNEAU (E.) & NAVARRO-MARTIN (A.). **Traitement des trypanosomiases expérimentales par les acides oxyaminophénylarsiniques.** —*C.R. Soc. Biol.* 1922. Dec. 9. Vol. 87. No. 37. pp. 1197-1199.

The authors have conducted an enquiry into the therapeutic action of a number of arylarsenic acids. They have had in view more especially: (1) the discovery of derivatives which do not produce nervous troubles; (2) the discovery of substances of greater therapeutic activity than "189" (aminooxyphenylarsenic acid); and (3) the determining of the part played by chemical modifications in the chemotherapeutic coefficient.

They first worked with isomeres of "189" and of its acetyl derivative "190"; there exist nine isomeres of "189", or in all ten oxyaminophenylarsenic acids. In later experiments they modified these compounds in various ways.

It was found that of the six oxyaminophenylarsenic acids examined the most active was "189".

W. Y.

VAN DEN BRANDEN & VAN HOOF. **Le "Trépol" ou tartro-bismuthate de potassium et de sodium dans la Trypanosomiase humaine.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 692–693.

Trépol, or the tartro-bismuthate of sodium and potassium, was tried on three cases of sleeping sickness, in two of which the cerebrospinal fluid was altered, whilst in the other it was normal.

Two of the patients were given, from April 27 to May 16, 1922, 1·5 gm. of the drug in five doses of 0·3 gm., each suspended in 3 cc. of oil. One of the two cases bore the treatment well, but the other developed a diffuse bismuthic stomatitis. The third case received three similar doses between April 27 and May 5, 1922, when, owing to the development of an intense stomatitis, gingivitis and ulceration of the mouth, the treatment had to be stopped. The injections were given deep into the gluteal muscles; some were followed by a painful non-suppurative reaction; there was no albuminuria.

In two of the cases the trypanosomes disappeared from the circulation for a few days only, whilst in the third the disease progressed rapidly to a fatal issue.

W. Y.

LEFROU & OUZILLEAU. **Étude du liquide céphalo-rachidien considéré dans ses rapports avec l'évolution et le traitement de la maladie du sommeil.**—*Ann. Inst. Pasteur.* 1922. Dec. Vol. 36. No. 12. pp. 834–850.

The second stage of sleeping sickness commences with the invasion of the cerebrospinal fluid with trypanosomes. Flagellates are rarely seen on direct examination of the fluid, and even examination of the deposit resulting from centifugation is often negative. The infestation of the central nervous system and sub-arachnoid space results, however, in cytological and chemical changes in the cerebrospinal fluid.

Normal cerebrospinal fluid contains only a few lymphocytes (1–3 per cmm.), but in trypanosomiasis its cytology undergoes quantitative and qualitative changes. The former comprise an increase in the number of cellular elements which may reach 1,000 to 2,000 per cmm.

As regards chemical examination of the cerebrospinal fluid, albumen is the sole constituent for which the present study has any real value. Increase of albumen is of equal importance to leucocytosis, and in general the two occur together, but the quantity of albumen varies much less than that of the cells. The quantity of albumen was determined by the method of DENIGÈS with Tanret reaction, the quantities thus obtained agreed with those given by the spinal albuminometer of Sicard and Cantaloube, which was employed as a control in many cases. The normal figure, 0·10–0·15 per thousand, is usually obtained in early stages with a slight leucocytosis; rarely the figure may exceed 1 gm. Therapeutic agents modify the lymphocytosis much more easily than the quantity of albumen, and it seems that variations in the albumen content give more valuable information on the evolution of the meningitis than cytological alterations.

The proteid in the cerebrospinal fluid consists of a mixture of sérine and globulin. In some affections of the central nervous system, globulin is increased much more than sérine.

The authors examined the cerebrospinal fluid of a number of cases with Weichbrodt's reaction, which has been used as a test for globulin. The test consists in adding 0·3 cc. of a 0·1 per cent. solution of sublimate to 0·7 cc. of cerebrospinal fluid; if a turbidity results immediately, the reaction is strongly positive; if at the end of two or three minutes, it is feebly positive; if the fluid remains clear, it is negative. The test was performed in 80 cases; in 15 in which the cerebrospinal fluid was normal, *i.e.*, the albumen was 0·15 and the cells 20 or less, the reaction was negative; of 65 in which the fluid was pathological, 52 had an albumen content of over 0·20 and cells of from 50 to 2,000 per cmm., and the reaction was always positive; whilst in the remaining 13 the albumen content was 0·20 or less and the cells were between 44 and 580 per cmm. The reaction was positive in 8 cases and negative in 5 cases, only 1 of which had a protein content of 0·20. In 7 cases where there was no alteration in the protein content, but only lymphocytosis, the Weichbrodt reaction was feebly positive in three instances.

The authors next pass to a consideration of the relationship between the presence of trypanosomes in the cerebrospinal fluid and the meningeal reaction. They define a meningeal reaction as existing when the cellular content surpasses 20 and the albumen content 0·15. In order to determine whether a meningeal reaction as thus defined signifies an invasion of the cerebrospinal fluid by trypanosomes, they have examined the cerebrospinal fluid of 240 cases of sleeping sickness. In 100 of these trypanosomes were found in the fluid and in 140 they were not found. Details of these examinations are set forth in the following tables:—

1. *Table showing the result of examination of the cerebrospinal fluid for trypanosomes in cases where the cellular elements were increased.*

Number of Meningeal Cases.	Proportion of Meningeal Reactions.	Percentage of Cases with Trypanosomes.
13 with 28 to 50 cells	0 with trypanosomes. 13 without trypanosomes.	0
62 with 50 to 150 cells	7 with trypanosomes. 55 without trypanosomes.	11·2
74 with 160 to 400 cells	27 with trypanosomes. 47 without trypanosomes.	36·5
91 with 410 to 2,000 cells.	66 with trypanosomes. 25 without trypanosomes.	72·5

2. Table showing the result of examination of the cerebrospinal fluid for trypanosomes in cases where the protein content was normal or increased.

Number of Meningeal Cases.	Proportion of Meningeal Reactions.	Percentage of Cases with Trypanosomes.
17 with 0·1 of albumen.	0 with trypanosomes. 17 without trypanosomes.	0
34 with 0·2 of albumen.	7 with trypanosomes. 27 without trypanosomes	20
108 of 0·3 to 0·5 of albumen.	33 with trypanosomes. 75 without trypanosomes.	30
81 of 0·6 to 1 gm. of albumen.	60 with trypanosomes. 21 without trypanosomes.	74

With regard to this part of their work, the authors conclude that in native cases of sleeping sickness:—

1. Cerebrospinal fluid which contains 0–20 cells and 0·10–0·15 of protein can be regarded as normal.
2. With 20–50 cells and below 0·20 protein, it is doubtful whether the second stage has commenced, in any case trypanosomes cannot be found by centrifuging the cerebrospinal fluid.
3. In cases with more than 50 cells and 0·20 protein, one can be sure that the disease is in its second stage even in the absence of trypanosomes on centrifuging the cerebrospinal fluid.

In the next section, the authors consider the relationship between the presence of trypanosomes in the blood or gland-juice and the meningeal reaction. They state that examination of the blood or glands gives information about the infectivity or not of the patient, but tells nothing about the state of the central nervous system. The absence of any relationship between the state of the blood and that of the cerebrospinal fluid is shown in a table.

From their observations it is concluded that examination of the blood or lymph throws no light on the evolution of the disease, and for this purpose examination of the cerebrospinal fluid is absolutely necessary.

The paper concludes with a series of remarks on the relationship existing between the meningeal reaction and clinical symptoms.

W. Y.

MARSHALL (Claude H.) & VASSALLO (S. M.). **The Treatment of Trypanosomiasis.** (A Further Report.)—*Brit. Med. Jl.* 1923. Feb. 10. pp. 231–235.

The authors in writing this paper had apparently two objects in view: (1) to record extended observations on cases treated by their method of "intrathecal injections of salvarsanized serum"; and (2) to reply to certain criticisms levelled by the reviewer at their previous papers [this *Bulletin*, Vol. 18, p. 153].

After referring to the earlier work on the subject by BALFOUR, VAN SOMEREN, THIROUX, D'ANFREVILLE and REICHENOW, the authors write as follows :—

> " From the above extracts it is quite clear that those whose duties included the treatment of sleeping sickness in endemic areas were even then—as they are now—dissatisfied with the adequacy of the methods at their command ; so that it is almost incomprehensible to the present writers that the fact that they were following (even if unwittingly) the suggestion of such a keen observer and logical thinker as Balfour should have aroused so much and so uncompromising a hostility.
>
> " Moreover, the method we now advocate is administratively and economically sound. The patient's treatment is completed in two or three days, when he is free to return to his village and friends. Large hospitals and camps are no longer required, nor is the patient's life made irksome by continuous drugging for long periods of time. The natives themselves appreciate these advantages and now come in of their own volition asking for treatment."

Having completed a further survey of the cases treated by various methods, the authors wish to present the results to the impartial reader, so as to make it clear where they are in agreement with the reviewer's arguments and where they consider their observations justify a totally different interpretation.

Dealing first with the virulence of the particular strain, and strains of trypanosomes met with in the Uganda Protectorate, the authors record in a table details of some 300 untreated cases observed for periods varying from 7-20 months.

TABLE I.—Showing the number of untreated cases alive after observation periods varying from 7 to 20 months.

District.	No. of Untreated Cases.	Months since first seen.	No. Alive.	No. Missing.	No. Dead.	Percentage of cases dead assuming that all who had disappeared were alive.	Percentage of cases dead assuming that all who had disappeared were dead.
Gulu ..	26	20	10	0	16	61	61
Arua ..	40	18	12	8	20	50	70
Toro & Katwe	28	18	11	8	9	31	60
East Madi ..	123	6	90	15	18	14·7	18·6
West Madi..	118	7	73	20	25	21	38

In another table are recorded the results of treating 11 Gulu cases, 9 with intrathecal salvarsanized serum and 2 with intramuscular salvarsanized serum. After the treatment the patients were sent home [some 300 miles] ; 2 advanced cases died on the way. The remaining cases were re-examined 15 months later, when it was found that another case had died and the others were alive and to all appearances well, but refused to allow any form of examination and are therefore omitted from the authors' calculations.

Six cases were treated with a single intravenous injection of neokharsivan or novarsenobillon only, varying in dose from 0·3 gm. to 0·6 gm. Of these, 2 were alive and well after 26 and 21 months respectively, 2 died after 8 and 4 months respectively, and 2 were found to have relapsed (trypanosomes found in blood or cerebrospinal fluid) after 3½ and 5½ months and were re-treated.

The authors summarize the results obtained up to date by treating sleeping sickness patients with a single intrathecal injection of salvarsanized serum as follows:—Of 12 unselected cases (2 advanced) observed for 2–3½ years, 2 have disappeared, 2 are dead, 8 are alive and well, giving a percentage alive and well somewhere between 66·6 and 83·0 according to whether the missing are dead or alive; of the 17 unselected cases observed for 18–21 months, 1 has disappeared, 0 are dead, 16 are alive and well, giving a percentage alive and well between 94 and 100. These data are set out in the manner adopted by the reviewer and are tacked on to a portion of the reviewer's Table IV (*loc. cit*).

Marshall and Vassallo consider that " this table in its present form not only affords considerable support to our first assumption, but also goes far to confirm our statement that our routine method of treatment has furnished better results than any one hitherto published treatment of a series of cases." They further point out that their cases " have only received one complete treatment—that is, one intravenous injection of arsenic and one intrathecal injection of serum the following day, as against the prolonged treatments of others—a point completely ignored by Yorke." [Why Marshall and Vassallo have chosen to tack their data on to emasculated Table IV instead of on to Table III, which relates to short treatments, is not clear; it scarcely seems necessary to point out that the reviewer was fully aware of the nature of Marshall and Vassallo's treatment when he wrote the critique in question.]

In Table V details are given of the cases treated by the method the authors suggest should become a routine one, with the reports at the various periods presented on former occasions.

Apart from two cases, this table needs no comment. Cases 18 and 20 were found at a subsequent examination several months after treatment to harbour trypanosomes in their glands, but in both cases the cerebrospinal fluid was negative.

> " Case 18 was treated on April 18th, 1920; three subsequent examinations were all negative; a fourth one, on July 27th, 1921, showed trypanosomes in glands.
>
> " Case 20 was treated on April 25th, 1920; subsequent examinations were all negative, but on April 20th, 1921, trypanosomes were recovered from a gland by puncture."

The authors state that obviously these two cases would be claimed by hostile critics as instances of the failure of their routine treatment; they, however, consider them for various reasons, which are given at length, as reinfections. Acting on this belief the two cases were retreated " with a single intravenous injection of arsenic," and up to date they have remained well. [Without in any way wishing to pose as a hostile critic, one cannot refrain from pointing out to the authors that under the circumstances it might appear to some " impartial readers " safer to admit at least the possibility that these two cases had not been cured by the intrathecal treatment. The two are, however, apparently included in the 100 per cent. of cures of the 17 cases observed for 18–21 months. Again there is some discrepancy between Table V and the summarized figures referred to previously. In Table V records are given of only 15 cases observed between 18–21 months and not 17 as stated previously. Finally, 8 months and 12 months make 20, and not 21, months, and this error is repeated through about half Table V.

TABLE V.—Cases treated by Intrathecal Salvarsanized Serum and Results to Date.

Case No.	Report up to 31.1.20.		Report up to 31.1.21.		Report up to 31.1.22.	
	Months since Treatment.	Remarks.	Months since Treatment.	Remarks.	Months since Treatment.	Remarks.
2	16	Well	28	Well	40	Well
3	1	Disappeared				
4	12	Well	24	Well	36	Well
5	1	Died (cause unknown)				
7	2	Well	14	Well	26	Well
8	4	Well	16	Well	28	Well
9	1½	Died				
10	2½	Died				
11	1½	Well	13½	Well	25½	Well
12	1½	Well	13½	Well	25½	Well
13	1½	Well	13½	Well	25½	Well
15	1½	Well	13½	Well	25½	Well
16	—	—	8	Well	21	Well
17	—	—	8	Well	21	Well
18	—	—	8	Well	21	Well
19	—	—	8	Well	21	Well
20	—	—	8	Missing	21	Well
21	—	—	8	Missing	21	Well
22	—	—	8	Well	21	Well
23	—	—	8	Well	21	Well
24	—	—	8	Well	21	Well
25	—	—	8	Well	21	Well
26	—	—	7½	Well	20½	Missing
27	—	—	7½	Well	20½	Well
29	—	—	7½	Well	20½	Well
30	—	—	6½	Well	19½	Well
32	—	—	6½	Well	19½	Well
33	—	—	1 day	Died*		
46	—	—	—	—	16½	Well
55	—	—	—	—	13	Well
60	—	—	—	—	11	Well
61	—	—	—	—	11	Well

* Chloroform poisoning.

[While the authors have evidently studied with some care the reviewer's critique and their present paper has to some extent benefited thereby, they have unfortunately failed to grasp its main point. The reviewer has no prejudice against intrathecal or any other form of treatment, but he has a very strong dislike to sweeping claims based on little or no evidence. Marshall and Vassallo's treatment may be all that they claim for it, but their earlier papers produced no evidence to support the claim, and their last effort is little better. Sleeping sickness varies enormously in virulence in different regions and even in the same region at different times, and the authors cannot be said to have commenced to establish their sweeping claims until they have at least shown by an adequate number of controls that an intravenous injection of salvarsan plus intrathecal injection of salvarsanized serum gives better results than an intravenous injection of salvarsan alone.]

W. Y.

REICH (W. W.) & BECKWITH (T. D.). *Trypanosoma brucei* **as a Filterable Virus. A Preliminary Note.**—*Jl. Parasit.* 1922. Dec. Vol. 9. No. 2. pp. 93–98.

The discussion and results are as follows :—

" The possibility of the existence of forms still smaller than those described in the stained smears, and their relation or identity with the filter-passing entity, must be borne in mind as a distinct possibility. The divergence in the results reported by various investigators may be due to (1) differences in the technique ; (2) peculiarity of the particular strain ; and (3) to the presence or absence of the specific form changes alluded to. In the opinion of the writers, the last condition should prove to be an important postulate.

" 1. Form changes are described in the blood and organs of white rats and guinea-pigs dying of infection with *Trypanosoma brucei.*

" 2. The viability of these forms is evidenced cytologically by the mitotic figures and physiologically by their infectiveness.

" 3. The blood and organs of guinea-pigs dying or dead of infection with *T. brucei,* and in which the form changes described occur, when filtered through a bacteria-proof filter, yield filtrates which in ten cases out of nineteen were infective for guinea-pigs.

" 4. The possible relation between this filterable virus and certain of the described ' involution forms ' or with a problematical ultra-microscopic stage in the life of this parasite is pointed out."

W. Y.

PEUTZ (J. L. A.). **Het serum met de eigenschap trypanosomen te dooden en zijn beteekenis voor de kliniek.** [Trypanocidal Serum and its Clinical Significance.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 14. pp. 1544–1550.

Peutz experimented with *Trypanosoma brucei* and tested the influence of different sera from healthy persons and patients suffering from various diseases on its pathogenicity for mice. The trypanocidal property of the normal serum may diminish or disappear in pathological conditions, but no fixed rules could be detected which might render this phenomenon of diagnostical importance.

W. J. Bais.

CHAGAS (Carlōs) & VILLELA (Eurico). [In Portuguese and English.] **Forma cardiaca da Trypanosomiase Americana. Cardiac Form of American Trypanosomiasis.**—*Mem. Inst. Oswaldo Cruz.* 1922. Vol. 14. No. 1. pp. 5–61 [Portuguese] ; 3–54 [English].

In the clinical picture of American trypanosomiasis there are certain very constant and prominent symptoms which characterize the cardiac form of the disease. As the result of observing a large number of cases, the authors state that they can be divided into two groups : one in which the cardiac changes are of muscular origin and the other in which the changes are associated with deficient nervous influences; the latter are, however, usually associated with the former. Arrhythmia constitutes the predominant note in such cardiopathies, and in its various types are interpreted anomalies of the principal functions of the muscle. The authors have studied the following groups and alterations of rhythm :—

1. Total tachycardias and bradycardias (of sinus origin).
2. Alterations of conductibility, manifested by—
    - (*a*) delay in the conduction of the contractile stimulus (increase of the space ac of P.V.);
    - (*b*) partial block;
    - (*c*) total block (dissociation of auriculoventricular rhythm with persistence of ventricular rhythm).
3. Premature contractions—
    - (*a*) auricular extrasystoles;
    - (*b*) ventricular extrasystoles;
    - (*c*) nodal extrasystoles.
4. Auricular tachysystole (auricular flutter).
5. Paroxystic tachycardia (auricular, ventricular and nodal).
6. Complete arrhythmia (auricular fibrillation).
7. Cardiac alterations.

Each of these conditions is dealt with in considerable detail. Under the heading " General symptomatology of the cardiac form," the authors consider the principal features, or rather those which are repeated with the greatest frequency. The symptoms of insufficiency occupy the first place and are indicated by low arterial tension, visceral congestion, dyspnoea, fatigue on exertion, oedemas, etc. The oedemas are relatively slight as compared with those seen in Bright's disease, doubtless on account of the absence of renal changes. The great generalized infiltration is only observed in relatively rare cases of cardiac asystole. The physical sign of great frequency is increase in the volume of the heart. Other signs are murmurs due to valvular insufficiency, obscuring of the heart sounds, alterations in intensity, and amplitude of the apex beat.

The various subjective symptoms, especially those directly related to the different forms of arrhythmia, are dealt with in considerable detail. Some patients complain of precordial anxiety and a sense of constriction originating in the epigastrium or the precordium and ascending to the throat, where it is most intense and causes dyspnoea and oppression, frequently followed by faintness and transitory dizziness. Other patients refer to general malaise with unpleasant perception of the heart beats, rapid or slow, and painful sensations in the epigastrium and larynx, accompanied by respiratory difficulty. Finally, a large number of patients complain only of the " agony," without being able to define or localize the sensations that constitute it. The authors add that " agony " means nothing to the student of symptomatology, but everything to the patient.

Palpitations form another symptom of great frequence in the cardiac form of the disease; they occur almost always in crises of short duration and subject the patient to the most painful sensations.

Faintness is a very common symptom, and is sometimes limited to simple transitory obscurity of vision, but at other times is more intense and accompanied by vertigo and loss of consciousness.

Referring to the prognosis, the authors state that the cardiac form is the type of the disease which occasions the greatest mortality. The condition is progressive; there is no possibility of retrogression, and the disease proceeds more or less rapidly to a fatal termination. Clinical details are given of 63 cases which came under the notice of the authors.

[It is impossible in a short summary to deal adequately with this lengthy paper. Those interested should consult it in the original.]

W. Y.

ROSENTHAL (F.) & FREUND (R.). **III. Ueber den Mechanismus des Trypanocidieschwundes bei Leberkranken.** [The Mechanism of the Disappearance of the Trypanocidal Bodies from the Serum in Liver Diseases.]—*Ztschr. f. Hyg. u. Infektionskr.* 1922. Vol. 97. No. 1–2. pp. 137–150.

In previous communications [this *Bulletin*, Vol. 19, p. 154 and p. 520] the author showed that in different liver conditions the trypanocidal titre of the serum remained within normal limits, save only in icteric conditions and in the severest diffuse parenchymatous diseases, whether accompanied by jaundice or not; in these the titre exhibited a definite and often considerable fall, sometimes reaching zero.

Experiments are recorded showing that the icteric serum obtained from a case of cancer of the liver blocking the bile duct, which had no protective action, did not inhibit the protective action of normal serum when mixed with it and injected into normal mice. In further experiments profound icterus was produced in mice by means of injection of 1 cc. of a 1 in 5,000 solution of dimethylpyrrolphenylarsenic acid; it was found that normal human serum exerted its prophylactic action in these jaundiced animals just as well as in normal mice. From experiments of this nature, the authors conclude that the failure of trypanocidal action of human serum in icteric conditions is not due to the limiting effect of the bile constituents, but to an actual absence of trypanocidal substance, owing to its non-formation. Consequently, as stated in their previous papers, the authors consider that they are dealing with a new physiological function of the liver.

The remainder of the paper is concerned with disproving certain explanations of the phenomenon which LANGE had suggested. These are briefly as follows:—

1. In liver diseases the complement content of the blood decreases proportionately to the content of bile acids.
2. The trypanocidal substance in human serum is a complex body which requires complement to activate it; the human serum loses its trypanocidal power owing to the complement destruction due to bile acids.
3. The mouse organism is not able to activate human amboceptor, and the icteric serum with its depleted complement can likewise not suffice, and consequently has no therapeutic value.

Rosenthal and Freund state that this thesis is wholly hypothetical and that the hypotheses are incorrect—a fact which they proceed to demonstrate by means of a series of experiments.

W. Y.

LEICHTENTRITT (Br.) & ZIELASKOWSKI (Mary). **Der Gehalt des kindlichen Serums an trypanoziden Substanz. Ein Beitrag zur serologischen Diagnose der Möller-Barlowschen Krankheit und der ihr verwandten Zustände.** [The Content of Trypanocidal Substance in Children's Serum. The Serological Diagnosis of the Möller-Barlow Disease and Related Conditions.]—*Jahrbuch d. Kinderheilk.* 1922. June. Vol. 98. 3rd Ser. Vol. 48. No. 5/6. pp. 310–239.

In this work the authors have enquired whether the serum of children suffering from Barlow's disease differed from that of healthy children in its trypanocidal action. It was found that in the acute stage of a case of Barlow's disease, the trypanocidal bodies in the serum were decreased, and that as convalescence set in the trypanocidal titre rose again. It is shown in a series of tables that the greatest decrease in trypanocidal activity of the serum did not occur during the acute stage of the disease or during a relapse, but during convalescence. The explanation of this is to be found in a definite biological interference in the organism. Four months after the disease, when the child was in good condition, the trypanocidal power of its serum had risen considerably. A similar reduction of the trypanocidal titre was seen in the case of a 13-months' child which for 2½ months had been fed solely on milk and was not thriving, and also in the case of a child exhibiting haemorrhages, the result of malnutrition. Such cases are probably in the pre-Barlow stage.

A number of cases of " defective " diseases in children were investigated. Two children suffering from the hydraemic form of disease, from farinaceous feeding, with ulceration of the cornea exhibited a great decrease of trypanocidal titre, but four others in the atrophic stage of the disease exhibited no such decrease.

W. Y.

BALFOUR (Andrew). **The Cure of Sleeping Sickness.**—Reprinted from *Empire Review.* 1923. Feb. 16 pp.

REGNAULT (F.). **A propos du paludisme en Corse.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 935–936.

HELMINTHIASIS.

HOOKWORM CAMPAIGNS (1919).*

Panama (1919).†

During 1919 work was completed in San Lorenzo district of the province of Chiriqui and in Santiago district of the province of Veraguas. The population of the first district numbers 8,871. Horconcitos, the capital, is 300 miles from Panama City, and the only available transportation is by means of small coastal steamers. Surrounding Horconcitos are many small camps ranging in size from ten to sixty huts. These are made of bamboo and are plastered with a fair "mortar" called "quincha" composed of cow faeces and clay. The huts have only one room in which the whole family and the ever-present pig sleep. None of the houses is provided with privies and soil pollution prevails. The sandy soil is very favourable to the propagation of hookworm. The local index of infection is 90 per cent. The majority of the people belong to the brown race. Their chief occupations are agriculture and cattle raising. They are very poor and lazy and their habits make progress difficult in the hookworm campaign.

In the district of Santiago, in the province of Veraguas, work which was commenced in January was continued throughout the year until December 15. Veraguas has a population of 60,000, and mining is the main industry. The town of Santiago is 375 ft. above sea level. The climate is damp and the rainfall heavy and accompanied by frequent thunderstorms. The principal occupations are agriculture, cattle raising and commerce. The hookworm index of the district is 97 per cent.

Campaigns were also conducted in the districts of David and Gualaca and at the central offices in Panama

In these areas, in which operations were completed during 1919, the number of persons examined for hookworm was 15,307. Of these 88·1 per cent. were found infected. First treatment was administered to 87·6 per cent. of those infected and 50·2 per cent. of those treated were cured. During the year much effort was expended in the endeavour to follow up treatment to a cure, with the result that the percentage of cured shows an increase of 14·4 per cent. over that of the previous year. Other intestinal parasites found incidentally during 1919 were Ascaris 40·2 per cent., Trichocephalus 15·5 per cent., Strongyloides 1 per cent., Taenia 0·5 per cent., Oxyuris 0·2 per cent.

Nicaragua (1919).‡

In Nicaragua the great mass of the population is a composite mixture of descendants from the native Indians, their Spanish conquerors, and the negro slaves introduced during the colonial period.

Operations were completed during 1919 in the areas of Comalapa and Camoapa in the department of Chomtales, and in Mina Leonesa and San Ramon—small centres in the department of Matagalpa. Work was also conducted in the Managua and Leon dispensary districts. A reinfection survey was made of the town of Nandasmo. In practically all the districts the work resolved itself into an effort to reduce mass infection. Little could be done to improve existing sanitary conditions, as the people were indolent in nature and nomadic in habit.

The number of persons examined for hookworm in areas completed during 1919 numbered 12,246. Of these 47·5 per cent. were found infected. First treatment was administered to 83 per cent. of those infected and 29·9 per cent. of those treated were cured. It was found that the addition of 25 per cent. chloroform greatly increased the anthelminthic effect of chenopodium without causing any unpleasant effects. In the rural districts of Matagalpa a mixture of chenopodium and croton oil (10 oz. chenopodium and 7·4 mils of croton oil) was used exclusively. This addition possesses certain advantages, particularly in rural communities, for the individuals treated can be kept in the dispensary until the croton oil produces mild purgation. Neither preliminary purge nor abstinence from food (except on the morning of treatment) is required.

---

* For 1918, see this *Bulletin*, Vol. 18, pp. 124–135.

† Report (No. 7,514) on Work for the Relief and Control of Hookworm Disease in Panama, by Dr. Frederick A. Miller.

‡ Report (No. 7,516) on Work for the Relief and Control of Hookworm Disease in Nicaragua, by Dr. D. M. Molloy.

Other parasites incidentally found were Ascaris 21·4 per cent., Trichocephalus 15·9 per cent., Oxyuris 0·3 per cent. A few cases occurred with Strongyloides and Taenia.

" In March 1919, a resurvey of the town of Nandasmo was made for the purpose of determining how permanent was the work that had been done there eighteen months earlier. The re-examination of 328 persons declared cured during the campaign of 1917, revealed that 190, or 57·9 per cent., of them had become re-infected. This infected group is divided into two parts : those who received treatment and were provided with privies during the dry season of the original campaign and those who did not receive treatment or inaugurate sanitary measures until after the beginning of the rainy season. The re-examination showed that the rate of re-infection during the dry season was 43 per cent. and the rate of re-infection during the rainy season was 67 per cent. Old soil-infection is supposed to have caused a large part of the re-infections in this area. Infected children are also supposed to have contributed largely to the re-infections, as children habitually pollute the soil in the immediate vicinity of the house.

" If sanitary work is to be effectual, it seems that the preliminary work must be done at least six months in advance of the laboratory work, in order that one dry season may elapse before establishing curative measures. During this dry season a large proportion of the larvae will be desiccated and the old soil infection will be reduced to a minimum. If sanitary regulations are then enforced and no new soil pollution occurs, the danger of re-infection will be greatly lessened."

British Guiana (1919).*

Owing to the illness of Dr. DERSHIMER, Field Director, the operations were brought to a temporary close on February 15, 1919. During the first six weeks of the year work was completed in Areas A and B of the West Coast district of Demerara, where it had been begun in 1918. The field of operation had been extended to include the villages of Uitvlugt and Stewartville, but was not completed when the operation was suspended.

The census for areas completed during 1919 was 4,079. 3,991 persons, *i.e.*, 97·8 per cent., were examined for hookworm. 72·5 per cent. of these were found infected. First treatment was given to 91·8 per cent. of these and 66·1 per cent. were shown to have been cured.

Records were kept of the eggs of other intestinal parasites incidentally found and 25·3 per cent. of the persons examined showed Ascaris, 12·6 per cent. Trichocephalus, and 3·6 per cent. Strongyloides. It is stated that as in other campaigns, these figures are not to be taken as a reliable index of infection.

St. Lucia (1919).†

The population of St. Lucia is approximately 50,000, and during the five years from 1915–19, practically half the territory of the island has been covered by hookworm campaigns. During 1919 operations were completed in the Canaries Valley and in a portion of the Soufriere Valley up to and including Soufriere Village, the second largest town in the colony, these embracing 35 square miles of territory on the leeward coast. As at Castries there are public latrines on the beach over-reaching the sea and each householder is supposed to arrange for the disposal of his night soil in the sea during certain hours of the night. This arrangement is fairly faithfully carried out except at Colombette and Coin de l'Anse, where a small ravine bed and a patch of cocoa serve as the dumping ground.

---

* Report (No. 7,524) on Work for the Relief and Control of Hookworm Disease in British Guiana by Dr. F. W. DERSHIMER.

† Report (No. 7,519) on Work of the Relief and Control of Hookworm Disease in St. Lucia, by Dr. Stanley BRANCH.

The total census for the areas completed during 1919 was 4,366 persons of whom 99·6 per cent. were examined for hookworm. Of these 59·7 per cent. were found infected. First treatment was administered to 98·1 per cent. of those infected and 92·8 per cent. of those treated were found to be cured. The most intensely infected area was found to be that lying between Anse la Raye and Canaries and in these areas 82·3 per cent. of the population were infected. The Soufriere Village had the lowest infection rate, viz., 45·7 per cent.

The record kept of other parasites, incidentally detected in the search for hookworm ova, showed that 22·3 per cent. of the 4,350 persons examined had Ascaris, 22·3 per cent. had Trichocephalus, and 1·7 per cent. had Strongyloides.

Four small Clayton-Lane Septic Tanks were installed at Soufriere and one erected for washerwomen and their children became so popular that an average of from 35 to 40 persons used it daily. Dr. Branch is of opinion that similar installations would prove satisfactory at the St. Lucia Schools, which at present are deplorably lacking in latrine accommodation.

Trinidad (1919).*

During 1919, the work was in charge of Dr. G. C. PAYNE until August 31, and thereafter of Dr. F. W. DERSHIMER and Dr. R. B. HILL. Work was completed in the Cunupia and Chaguanas areas and at the Tacarigua Orphanage.

During the year, 9,167 persons were examined in the areas in which operations were completed. Of these 81·7 per cent. were found infected. First treatment was given to 93·2 per cent. of these and 74 per cent. of those treated were pronounced cured. This comparatively low percentage of cures was due to physical factors beyond the control of the staff and people. The rice harvest demanded continuous labour from everyone during that season and thus hampered the administration ; the high cost of treating isolated cases in sparsely settled localities and the occurrence of an influenza epidemic necessitated the suspension of the campaign for six weeks, during which period many people left the district.

The chief vermifuge used was 45 gr. of thymol finely powdered, mixed with an equal quantity of sodium bicarbonate and administered in gelatine capsules in two equal doses, one at 6 a.m., and one at 8 a.m , preceded on the previous evening and following two hours after the dosage by Epsom salts. Oil of chenopodium was given to children and to adults with latent and active dysentery. In the case of very small children, castor oil was used as the purge.

The infection rate with other parasites, as observed incidentally in the course of the work, was for Ascaris, 29·8 per cent. ; Trichocephalus, 27 per cent ; and Strongyloides, 6·1 per cent. Out of a total of 49,649 persons, Taenia was observed in only 20, and Oxyuris in 173.

Seychelles (1919).†

Intensive operations were completed during 1919, in the area comprising the island of Praslin and the adjacent islands of Round Island, Curieuse, Aride, Cousin and Cousine and in the Digue area, comprising La Digue,

---

* Report (No. 7,533) on Work for the Relief and Control of Hookworm Disease in Trinidad, by Dr. G. C. PAYNE.

† Report (No. 7,528) on Work for the Relief and Control of Hookworm Disease in Seychelles, by Dr. J. F. KENDRICK.

Felicite, Sisters, and Marianne Islands. Upon the completion of these areas in 1919, all parts of the Seychelles had been dealt with, save numerous very small islands lying some hundreds of miles from the main group and having exceedingly sparse populations.

Most of the people of Praslin work on the cocoanut estates or ply small sailing vessels between the islands. The population of the five small islands grouped with Praslin is 169. The island La Digue is about four square miles and most of the population is settled on the seashore of the western side, on what is named the " Plateau "—a low, moist, sandy ground particularly well shaded by palms.

99·8 per cent. of 3,715 inhabitants were examined for hookworm in the areas completed during 1919. 86·6 per cent. of those examined were found to be infected. First treatment was administered to 97·4 per cent. of these, and 91 per cent. of those so treated were cured.

From the beginning of the work a record was kept of other ova than hookworm, incidentally detected in the stools. Of a grand total of 21,766 persons examined, 66·3 per cent were found infected with Ascaris, 95·3 per cent. with Trichocephalus and 3·3 per cent. with Strongyloides.

On the completion of the regular campaign in 1919, it was decided to conduct a re-campaign for complete eradication. The Seychelles presented conditions peculiarly favourable for an experimental demonstration in the complete eradication of hookworm disease from a specific area because of their remote location, their small populations and the splendid co-operation of both Government and people.

A census of areas completed in this re-campaign up to December, 1919, showed a total population of 7,108. Of these, 99·8 per cent. were examined again, and of these 52·3 per cent. were found infected. Treatment was given to 96·3 per cent. of these and 91·5 per cent. of those treated were cured.

The results of the re-campaign was to show that the infection rate of 96·1 per cent. ascertained in 1917, had dropped 43·8 per cent. in the two intervening years as a result of the hookworm campaign.

Ceylon (1919).*

Hookworm control operations were completed during 1919 in the areas Gampola, Kotagala, and Talawakelle in Central Provinces ; and Badulla in Province of Uva.

In Ceylon the work has been confined almost entirely to districts made up of tea and rubber plantations. On the rubber plantations, which are situated at elevations below 2,500 ft., every condition favours the propagation of hookworm disease ; the climate is warm, the soil sandy and the shade and moisture extensive. The clay soil of the tea plantations, which are situated at elevations over 2,500 ft., is somewhat less favourable to the development of hookworm larvae, but even here the infection rate is high. The estates are worked by imported " Tamil " labourers recruited from southern India and are under the direction of English Superintendents. The labourers are housed in barracks or " lines " consisting of either a single row of rooms or of a double row placed back to back. The floors and walls of the rooms are of mud and the roof of zinc. Each room usually harbours a family of about five persons and is approximately twelve feet square. All " lines " are by law provided with latrines, but great difficulty is experienced in preventing soil pollution.

The campaign was conducted upon the intensive plan except that only a percentage (10–20) of the coolies were examined for hookworm ova prior to treatment. The census for the areas completed during 1919 showed a population of 111,002. 13·9 per cent. of these were examined for hookworm and 77·5 per cent. were found infected. First treatment was administered to 88,602 persons, and 77·9 per cent. of these treated were pronounced cured. From the beginning of the campaign in Ceylon in 1916, to the end of the year 1919, 444,695 treatments have been administered.

---

* Report (No. 7,542) on Work for the Relief and Control of Hookworm Disease in Ceylon, by Dr. W. P. Norris, Dr. W. P. Jacocks, Dr. S. A. Winsor, Dr. S. T. Gunasekara, Dr. Fitzroy Keyt.

Of other parasites seen by the microscopists since 1916, it is noted that 65·3 per cent. of 93,333 persons examined harboured Ascaris, 53·7 per cent. Trichocephalus, while only 19 persons were reported with Strongyloides, 6 with Oxyuris and 3 with Taenia. The figures probably do not give an accurate index of these infections.

" Chenopodium was used as the anthelmintic during 1919. The directors of the work in Ceylon have worked out a standard dosage table for children and adults. Children who *appear* to be between the ages of two and twelve years receive 1 minim (·06 mils) for each year of age, minus 1 minim. This means that a child of seven receives 6 minims (·37 mils), a child of six, 5 minims (·31 mils), and so on. Persons from thirteen to fourteen years of age receive 13 minims (·81 mils) ; those from fifteen to sixteen, 16 minims (·99 mils) ; those from seventeen to eighteen, 20 minims (1·24 mils) ; and those from nineteen to twenty, 24 minims (1·49 mils). It will be seen that especially small doses are administered to children under twelve. The oil is dropped from a dropping-bottle into simple sugar syrup, the most satisfactory of all vehicles for administering this oil.

" In the administration of chenopodium in Ceylon, the best results were secured when the patients were allowed their usual diet on the day before treatment. As the average laborer in this country is greatly under-nourished, it was found that coolies who ate an ordinary meal on the afternoon before treatment were much less apt to suffer collapse or syncope after medication than those who were limited to an afternoon meal of rice gruel. The percentage of cures was as high among patients whose afternoon meal was not restricted as among those who ate a light repast.

" During 1918, there was developed a special form of treatment which was used extensively during that year and in the early part of 1919. According to this treatment the preliminary purge was omitted, and a mixture of chenopodium 40 parts, and croton oil 1 part was given in the standard dosage prescribed for chenopodium, graduated according to the apparent and not the stated age of each person. The dose was usually given in two equal parts with an interval of one hour between. Two hours after the last dose of vermicide, the patient received a purgative dose of magnesium sulphate. All patients were kept under observation by the dispenser, from the time of giving the first portion of the vermicide until the medical officer in charge was satisfied that the post-treatment purgative had acted freely. Meanwhile, the patients were allowed to rest in a sheltered place. Temporary sheltered latrines for men and women were provided near the resting place, and an apothecary or dispenser saw that the latrines were properly used. Before the patients were discharged, they were strongly counselled not to eat raw fruit or vegetables for a day or two after treatment, but to take chiefly rice and rice gruel.

" At first, the advantages of this form of treatment were found to be many. Some of its best features were that smaller doses of salts were required to secure effective post-treatment purgation, that such after-effects as exhaustion, rheumatoid pains, and tinnitus were much less in evidence, and that in almost all cases the patients were able to work the following day. In the early part of 1919, however, a small percentage of cases treated with the chenopodium-croton oil mixture developed enteritis. In some patients dysenteric symptoms developed which required prolonged treatment. These untoward symptoms created a prejudice against the mixed treatment which was difficult to allay, and in May it was decided to discontinue its use temporarily, substituting for it the plain chenopodium treatment.

" Morbidity statistics gathered from numerous Ceylon estates illustrate the degree to which improvement in general health follows treatment for hookworm disease. During the 1918 influenza epidemic, on all the estates embraced within the Maskeliya area, where the total laboring population numbered 17,838, the death rate from influenza and its sequelae was twice as high among persons who had not been treated for hookworm disease as among those who had received treatment. The deaths numbered 111, or 7·5 per thousand, among 14,659 persons who had received treatment for hookworm infection previous to being attacked with influenza, as compared with 43, or 13·8 per thousand, among persons who had not been treated for hookworm disease.

" In another area, the District Medical Officer reported that only 2,604 patients were admitted to hospital in 1918 after measures against hookworm disease had been carried out in his locality, as compared with 3,694 in 1916 before systematic operations for the control of the disease had been inaugurated. This represents a reduction of 27 per cent. in the number of hospital admissions.

• • • • •

" The estate laborer's disregard for sanitation has resulted in a high rate of re-infection among persons previously treated and presumably cured. On the thirty-three estates of the Matale area whose laboring force was partially re-examined during 1918, following the lapse of at least a year after they had been cured, the average percentage of re-infection was 88 among a total of approximately 3,000 persons examined. The rate ranged from as low as 45 per cent. on one estate to as high as 100 per cent. on ten. Nineteen of the estates had re-infection percentages between 91 and 100 ; six between 81 and 90 ; three between 71 and 80 ; and only five less than 70. On thirty-eight estates of this area where re-examinations were made during 1919, re-infection rates varied among persons cured twenty-two months earlier, from 40 to 91 per cent.

• • • • •

" The figures presented in the foregoing paragraphs should not be interpreted as indicating the failure of anti-hookworm measures in Ceylon. The percentage of re-infection is not an adequate criterion for determining the efficacy of a treatment campaign. The problem of hookworm control is in the main one of reducing mass infection. The practical phase of the task is concerned with the removal of the largest possible number of worms from the largest possible number of infected persons. Upon this basis the best criterion for judging the effectiveness of a curative campaign in any area is not the percentage of infected persons who are cured or who remain cured, but the proportion, expelled or destroyed, of the total worms harbored by the population. Even though in certain areas, from 50 to 100 per cent. of the persons formerly cured have become re-infected, there is little doubt that the average number of worms harbored by each infected person has been very materially reduced. Since hookworms do not multiply within the human host but gradually die of old age and are eliminated without the use of medicine, infection is maintained solely by the entrance of new worms into the body. With the growth of effective sanitation, the possibility of new infection will gradually diminish and in time patients harboring light infections should automatically become hookworm-free."

Siam (1919).*

An initial demonstration in the relief and control of hookworm disease which was begun in Siam in February, 1917, was continued until March, 1919, under the directorship of Dr. M. E. Barnes. The campaign was confined to the ancient city of Chiengmai and its environs. During the two and a half months in which operations were conducted in 1919 dispensary work was accomplished in the districts of Handong, Ban Maa, Doi Saket, Vieng Pa Pao, and Maa Sui, and treatment for hookworm disease was administered to 5,538 persons and considerable incidental work was also done.

---

* Report (No. 7,538) on Work for the Relief and Control of Hookworm Disease in Siam, by Dr. M. E. Barnes.

Queensland (1919).†

From October, when the campaign under the joint auspices of the International Health Board and the Australian Government began, until December, 1919, two intensive units were maintained, one at Bowen, with Dr. S. M. LAMBERT in charge, and the other at Mackay, under Dr. G. P. PAUL. As work was not completed in these areas by the end of 1919 the report given is merely one of progress.

Fifty-five per cent. of the territory of Queensland lies within the Tropics. The Great Dividing Range parallel with the coast separates a wet and narrow coastal belt from a dry interior. The population is essentially British with a small intermingling of Italians, Slavs, Chinese, and of Aboriginals. The average density is one per square mile and the larger settlements and bulk of the people are on the coast. The chief industries are sugar production on the coast and farming in the interior, with metal and coal mining in the hills. Although North Queensland has been for four decades under development by white settlers, it lacks the sanitary conveniences so necessary to health in the Tropics.

In the Bowen and Mackay areas, in which operations were conducted during 1919, the number of persons examined were 7,731, of whom 8·5 per cent. were found infected. Special attention was directed to the aborigines, as these are supposed to be the chief carriers of the disease, as 80 per cent. of all examined to date in Australia have been found infected.

R. T. Leiper.

[The various Reports referred to in the footnotes are issued by the Rockefeller Foundation, International Health Board, as lithographed Reports for limited distribution.—ED.]

---

† Report (No. 7,540) on Work for the Relief and Control of Hookworm Disease in Queensland, Australia, by Dr. W. A. SAWYER.

REVIEWS AND NOTICES.

COLES (Alfred C.). **Critical Microscopy. How to get the Best out of the Microscope.**—pp. viii + 104. With 8 illustrations. 1921. London: J. & A. Churchill, 7, Great Marlborough Street. [Price 7*s*. 6*d*. net.]

This small book deals with subjects of much importance and interest to all those who wish to obtain the best results from the microscope. Although there are already many excellent and justly valued works on microscopy, Dr. Coles presents the practical aspects of the subject in such an attractive and readable way that his book is a welcome addition to their number.

As the title implies, the greater part of the book is devoted to the methods of obtaining a critical image of a microscopic object. Whilst it is indisputable that the highest attainable optical efficiency cannot be secured without attention to such subjects as critical illumination, tube-length adjustment for the thickness of the cover-glass, the use of the bull's-eye condenser, and so on, the fact remains that, even in the very exacting field of protozoological research, most excellent work has been done by persons of different nationalities, most of whom used the microscopes, which are to be seen in most laboratories, of the usual Continental form; and yet critical images (as defined by Mr. E. M. NELSON) are unobtainable with such apparatus. One might argue that the results, brilliant as many of them are, would have been still better if the investigators had been willing to devote more time and attention to the details of their methods of observation; but, when one looks at the beautiful and accurate drawings of such men as EHRENBERG, STEIN, and BÜTSCHLI, one cannot believe that there was much amiss with their technique. Certainly, for most medical work, the refinements mentioned above are not indispensable. The ordinary practitioner is usually willing to sacrifice, even to a considerable extent, the brilliancy of the image to the saving of time gained by his somewhat rough-and-ready methods. Most of the slides that he examines are of stained material, and he is usually more concerned with a speedy diagnosis than with an investigation of minute details of structure. But even the medical practitioner, when he turns to high-power dark-ground illumination or photomicrography, will find that some improvement of method is necessary, and will be grateful for the practical advice which Dr. Coles gives him.

The author discusses the choice of lenses for ordinary pathological, bacteriological and protozoological work. Probably nine-tenths of the workers at these subjects in this country use the following objectives: $\frac{2}{3}$ in, $\frac{1}{6}$ in., and $\frac{1}{12}$ in. oil immersion. Dr. Coles recommends, in place of the $\frac{1}{6}$ in., a good $\frac{1}{3}$ in., or apochromatic 8 mm. He points out that such a lens has considerable penetration; that its N.A. is not too large for dark ground illumination obtained by means fo a condenser, used dry with a stop; that it has a long working distance; that it will stand the highest eyepiece, and, with suitable tube-length, gives a range of magnification from less than 60 up to nearly 600 diameters.

The subject of dark ground illumination is well dealt with. For ordinary diagnostic work Dr. Coles prefers the use of a $\frac{1}{3}$ in. (or 8 mm. Apo.), a dry achromatic (*not* an Abbe) substage condenser fitted with a central expanding stop, an ordinary paraffin microscope lamp, and a bull's-eye. The advantages of this equipment are that the same condenser is used as that required for ordinary work; within reasonable limits the thickness of the slide is not of much importance; the slide does not require to be oiled to the condenser, and there is, therefore, no risk of the oil getting on to the stage; one can pass from dark-ground to ordinary illumination in a moment. It is not claimed that as brilliant an image is obtained by this method as by the more customary use of a specially constructed condenser in oil-contact with the slide, but the convenience and simplicity of the plan are certainly very much in its favour.

Dr. Coles writes very modestly of his experience of photomicrography, though his skill in this matter is well known. It is a pity that the limits of space have obliged him to deal with the subject so briefly, but many useful hints can be obtained from the descriptions he gives of his apparatus and methods.

The book is full of interest to all microscopists; it abounds with useful suggestions, and will be recognized by all readers as the work of an accomplished practical expert.

H. J. Walton.

v. OSTERTAG (R.), WOLFFHÜGEL (K.), & NÖLLER (W.). **Die tierischen Parasiten der Haus- und Nutztiere. Band I. Die wichtigsten parasitischen Protozoen des Menschen und der Tiere,** VON W. NÖLLER. **I. Teil. Einführung in die allgemeine Kenntnis und die Untersuchung der parasitischen Protozoen und Abschnitt I. Die parasitischen Rhizopoden.** [The Animal Parasites of Domestic and Useful Animals. Vol. I. The Most Important Parasitic Protozoa of Man and Animals, by W. NÖLLER. Part I. General Introduction and the Investigation of Parasitic Protozoa, and Section I. The Parasitic Rhizopods.] 8vo. pp. 1–272. With 113 figures in text and 3 coloured plates. 1922. Berlin; Richard Schoetz. [Price M.450.]

This publication is the first instalment of a new German work which is to essay the ambitious programme of reviewing the animal parasites of domestic and industrially useful animals; at least, so its general title implies. But a perusal of this first number indicates that its scope is yet wider, for we here find "domestic and useful animals" so interpreted as to include man, fish, insects, and any other animals which occur in human habitations and surroundings, or which are common objects of laboratory study. Even parasites of plants are at times embraced in this comprehensive system, while the term "parasite" itself has, it seems, been sufficiently expanded to include coprozoic, commensal, and even free-living forms. If the liberal treatment here accorded to the Rhizopods is to set the standard for the rest of the work, it is thus difficult to see where, or when, the publication will end; and it is curious to reflect that there is probably no publisher outside Germany who would be willing or able to bring out, at the present time, a work of like scope on so lavish a scale and at such a price.

In its general get-up this part of the work is good. It is profusely, and, on the whole, well, illustrated; and it is well printed on good paper. Not a few of the illustrations are new, and therefore possess an additional interest for those engaged in working at the subject with which the volume deals. Plate 3 may be specially noted, though it is a luxury rather than a necessity; for its sole purpose is, apparently, to show some of the various colours that various protozoa may assume when stained in a variety of ways. Unfortunately there is no index, but this is a defect which is doubtless excusable by the fact that the present part is but the first of a series. For a work of this sort, moreover, the number of misprints is somewhat excessive—at least, several dozen having been noted.

The present part consists of two main sections—general and special. In the former, which is intended to serve as a general introduction to the study of the Protozoa, with special reference to the parasitic forms, there are four chapters, dealing, in order, with the morphology and life-histories of protozoa generally; the technique of practical protozoology; the cultivation of parasitic protozoa; and the general systematics of the group. The second section then deals descriptively with the parasitic Rhizopoda, and each of the two main sections concludes with a long list of relevant references.

We may now, after this brief outline, consider the individual parts in more detail.

The general part follows familiar lines, and—perhaps for this very reason—contains many statements with which the present reviewer heartily disagrees. But some, at least, of these are undoubtedly erroneous. For example, the author, while he does but follow precedent in defining the Protozoa as "unicellular," adds further (p. 12) that, if one objects to this expression, one can also, "with SACHS and HARTMANN," regard the Protozoa as "non-cellular," contrasting them with the multicellular organisms, and dividing them into monoenergid and polyenergid forms according to the number of their nuclei, "as DOBELL does." A more perverse statement on this subject it would surely be hard to make. The truth is, of course, that the conception that the Protozoa are "non-cellular" originated with the last-named author, with whose views the "energid" hypothesis of SACHS, and the "poly-energid nuclei" of HARTMANN, have nothing to do. Neither of these two authors first called the Protozoa "non-cellular," and their own hypotheses are, indeed, not easily compatible with the conceptions involved in this expression. The above statement is so manifestly wrong that it would be hardly worth while to call attention to it, were it not that it is by no means an isolated instance of the way in which the author deals with the observations and views of others—especially of English workers. [Indeed, he misquotes and misrepresents the present reviewer's work and views—to take an instance—with such regularity, whenever he has occasion to mention them, that it seems probable that he either has not read his writings or else cannot read English accurately. That he has misrepresented them wilfully on so many occasions, the reviewer is unwilling to believe; though he cannot refrain from expressing a hope that those who are unacquainted with his work will—if it interest or concern them—read what he has himself written before accepting as his what Nöller attributes to him in this book.]

On the whole, the introductory sections are clearly written; but some of the matter contained in them is of a very elementary character, and appears to be designed for the use of persons who have never entered a laboratory or seen any of the apparatus usually employed in such a place. Consequently, some of the pages dealing with the microscope, and with such subjects as ordinary laboratory procedures, make tedious reading. The author, apparently, often assumes a complete ignorance in his readers—and even, at times, a lack of ordinary common sense. At least, this is the impression one gets from passages such as that (on p. 78) wherein one is told that a 1 per cent. alcoholic solution of hydrochloric acid can be made by adding 1 cc. of the acid to 100 cc. of alcohol. Another statement, in the same place, to the effect that a 5 per mille solution is made by adding 0·4 cc. of HCl to 100 cc. of alcohol, is, however, exempt from such criticism, as this is certainly not generally known.

Though elementary, the author's teaching is not invariably faultless. Some of his statements, for example, concerning cytological methods and theory will not command universal assent. Thus, he lays it down (p. 19) that staining is primarily a chemical and not a physical process; but this can hardly be regarded as an expression of the most competent and informed opinion at the present day—notwithstanding the author's appeal to experience in support of it. Again, the statement (p. 77) that haematoxylin "in a pure state" is a "red-brown crystalline powder" may be categorically contradicted; and many a reader will probably ask himself how far a writer capable of making such a statement can really be qualified to instruct others in the theory of cytological staining. English readers will be amused to learn (p. 55) that they should study the living organism—as well as stained preparations—because of SCHAUDINN's classical exhortation and example; and many of them will, no doubt, share the reviewer's surprise when they read (p. 64) that the making of wet films—in place of dry ones—was introduced into protozoology chiefly through the efforts of HARTMANN and his school in Berlin. On p. 65 we are admonished to exercise extreme care (*peinlichst darauf zu achten*) to insure that our mounting medium—resins and oils are specifically indicated—" contains no traces of acid, and forms none in the course of time." Had the author told us how this may be done it would have been more helpful; but in the absence of his further instructions on this point, we can only assume that he is unaware of the chemical composition and reactions of Canada balsam and similar substances. A considerable number of other criticisms could easily be levelled at many other statements in the sections dealing with cytological technique; but as a whole this part will, no doubt, be helpful to beginners.

The section on the cultivation of parasitic protozoa (pp. 93–108) is one of the best in the book; and this is evidently because the author is here on ground which is personally more familiar to him. Some of the methods cited are, however, not above criticism (*e.g.*, ESCOMEL's method of cultivating *Trichomonas*, p. 99).

A short section on the classification of the Protozoa (pp. 108–112) contains nothing specially noteworthy—unless it be the grouping of the Ciliata and Suctoria in the Class " Infusoria *O. F. Müller*." The " Infusoria " of that admirable old Dane were something very different; but perhaps one ought not to expect strict accuracy in a matter of ancient zoological history from a very modern veterinarian.

References to Part I occupy a little over nine pages, and are preceded by a brief indication of the chief periodical and other works of reference dealing with parasitic protozoa. Among the conspicuous omissions here we may note the *Zoological Record*, the *Zoologischer Jahresbericht*, and STILES and HASSALL's *Index-Catalogue*. The first and last may, perhaps, have been intentionally left out owing to the author's evident preference for German literature. Only one French publication is mentioned—and that somewhat grudgingly.

The Special Part (pp. 125–272) deals systematically with the parasitic Rhizopods. We here find descriptions of the amoebae which have been found in man and domestic animals, and also of a number of coprozoic and free-living species. Even the Heliozoa and Mycetozoa come into consideration—the Vampyrellidae, which have little medical or veterinary interest, being included, and placed among the Heliozoa (in the reviewer's opinion, with little justification). Perhaps the most remarkable systematic novelty, however, is the inclusion of *Cercomonas*—under the alias of *Cercobodo*—among the " Rhizomastigidae." How this well-known genus of flagellates comes to be found in such strange company is difficult to understand; and the difficulty is increased when we find *Dimastigamoeba* given first as a synonym of *Cercobodo* (p. 216) and two pages later apparently treated as a subgenus of the same genus. It is clear that the author is either unfamiliar with these genera and the works of others dealing with them, or else holds revolutionary views on classification which he prefers not to make public. As they stand, his statements concerning " *Cercobodo* " appear to the reviewer to contain a series of gross blunders.

It is in the accounts of the amoebae of man and domestic animals, however, that readers of this *Bulletin* will be most interested. The author follows, for the most part, the reviewer's nomenclature and synonymy of these organisms: though this is not always obvious, for he usually does not note the fact, and is at times careful to indicate that he has reached an identical conclusion by a different route. In matters of history he is not invariably correct, and displays a noticeable bias. We are thus not surprised to find the names of LEWIS and CUNNINGHAM omitted from the historic note on *Entamoeba coli* (p. 189), and the names of WALKER, WENYON, DARLING, and others often lacking in places where they might, with propriety and truth, have at least been mentioned.

To the present reviewer, the sections dealing with *E. histolytica* and *E. coli* are particularly difficult to discuss briefly, because they contain so many statements which he has himself elsewhere endeavoured to correct. It is, in his opinion, impossible to understand the life-histories of these organisms without knowing and understanding the work of WALKER, and some of the more recent English investigators; but it is clear that Nöller either has not read or has not understood this work—notwithstanding his frequent references to it. How completely he has failed to understand the reviewer's observations and views—to take but one instance—is clearly shown in the following sentence (p. 174): "DOBELL (1919) extends the views elaborated by SCHAUDINN (1903) in regard to the tissue parasitism of *E. histolytica,* to its *minuta* forms as well." [This involves a fundamental misconception of almost everything that the author mentioned—the present reviewer—has ever written on the life-cycle of this parasite. Not only does he not regard the "*minuta* forms" as tissue parasites, but he believes that nobody can understand the life-history of this species if he holds such a view.] Similar misconceptions of the opinions and observations of other workers mar much of what the author has to say regarding geographical distribution, pathology, treatment, and other subjects discussed in this section.

The description of *Iodamoeba* and *Endolimax nana* contain a number of statements, concerning nuclear structure and other points, which the reviewer regards as demonstrably incorrect. It is satisfactory to note, however, that "*Councilmania lafleuri*" is not accepted as a separate and valid species, and that "*Craigia*" is regarded with scepticism. "*Leydenia gammipara*" is treated, however, with a respect which it by no means merits—doubtless in deference to its inventor.

References to the "Literature on Rhizopods" occupy over 30 pages at the end of the volume. Little attempt seems to have been made to condense these, however, and some are duplications of those appended to the first section. They contain a by no means insignificant number of mistakes, moreover, and from the bibliographer's standpoint leave a good deal to be desired. Some of the abbreviations used are unfamiliar. The reviewer has received a very decided impression that the author has not always consulted the originals of the works which he cites, while his references include a good many memoirs whose contents receive little or no notice in the text.

It is neither possible nor necessary to enter into a more detailed discussion of the present work in this place, but a few concluding remarks may perhaps be allowed to a reviewer who has read the work with care and can claim to have some first-hand knowledge of all the subjects with which it deals. The general impression which he has gained is that the author's intentions have been excellent and his patriotism unimpeachable, but that his knowledge both of the Protozoa as a whole, and of many of the Rhizopods which he enumerates and discusses, is not profound. The reviewer cannot help thinking that if the author—who is better known for his work on blood-protozoa than for his contributions to our knowledge of amoebae and their next of kin—had spent more time in obtaining a first-hand acquaintance with many of the animals with which he deals, and had devoted more attention to reading many of the works which he cites, then he would have expressed opinions often very different from those here delivered. Nobody knows better than the reviewer how difficult it is to write a book on so complex a subject, and how much labour must go to its making; nevertheless, he closes this volume with a feeling of disappointment. He has learnt little from it though he had hoped to learn much. There is indeed hardly a page which does not appear to him to invite criticism or contradiction. But the work, as a whole, will doubtless have its uses, and will probably take a worthy place among that vast array of bulky, comprehensive, and useful—though often not too accurate—compilations which are so characteristic of the scientific output of Germany. Outside its country of origin, however, it is hardly likely to win enduring recognition as an authoritive exposition of the present state of knowledge of the parasitic Rhizopods.

Clifford Dobell.

GIMLETTE (John D.). **Malay Poisons and Charm Cures.**—pp. xii+ 260. With 2 plates. 2nd Edition. 1923. London: J. & A. Churchill, 7, Great Marlborough Street. [Price 8*s*. 6*d*. net.]

The first edition of this "curiose" book was reviewed in Vol. 6 of this *Bulletin*, pp. 111-112. The present edition covers the same ground, but so much more amply, in so much more detail, and in a manner so much more scholarly and artistic, as to be a new book improved almost out of recognition. From 127 small octavo pages it has swelled to 260 pages of large octavo, and its six chapters are increased to ten. Of the four new chapters, one is of an introductory kind, dealing in a general way with Malay methods of poisoning and subtle murderous predilections; the other three treat in interesting detail of charms, spells and amulets, necromancy and exorcism, and all the apparatus of the magician—matters which in the first edition did little more than give atmosphere and general effect. For the rest, there is a much fuller account of the Bomor—a medicine-man of that ever popular kind whose dour art and materia medica are strongly seasoned with magic—and the more prosaic chapters on poisons contain additional matter and are treated more scientifically. Another great improvement is the list of appropriate references adjoined to every chapter. In a "Foreword" by Sir W. WILLCOX the calamitous circumstances under which the author became grievously and permanently incapacitated in the discharge of his duties are feelingly referred to.

A. Alcock.

MACKENNA (Robert W.). **Diseases of the Skin. A Manual for Students and Practitioners.**—pp. ix+451. With 160 figs. 1923. London: Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, W.C.2. [Price 21*s*. net.]

This is intended as a manual for students and practitioners and is well adapted to that end. An attempt at classification on strictly etiological rather than morphological lines is a novel feature of the book, and recent views on focal sepsis are very fully dealt with. The book reflects a wide personal experience, and is accordingly especially valuable in practical directions for treatment. Its convenient size and admirable illustrations and letterpress make it an altogether attractive volume and a welcome addition to text-books for the over-driven student of medicine of to-day.

E. G. Graham Little.

CLARKE (J. Jackson) [M.B. Lond., F.R.C.S., Senior Surgeon to the Hampstead and North-West London Hospital, and Surgeon to the Royal National Orthopaedic Hospital]. **Protists and Disease.** pp. xi + 229. With Frontispiece and 61 figs. 1922. London: Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden. [Price 15*s*. net.]

It must not be assumed from the title of this book that the author is presenting his readers with a general account of the relation of protists to disease. His intention is to trace the life-history of various algae, fungi and allied organisms with the object of demonstrating that the various enigmatical bodies which occur in the lesions of cancer, syphilis, molluscum contagiosum, small-pox and other conditions are best explained on the assumption that they represent stages in the evolution of vegetable organisms similar to those he has described. In many cases these bodies are devoid of nuclei, and the author discusses at some length the chromidium theory, adopting the view which is accepted by many protistologists that certain protists are devoid of true nuclei. The chromatin material occurs in the form of granules distributed through the cytoplasm and these may at certain stages of development become aggregated into true nuclei. As illustrations of this process he discusses the chromidia which have been described in *Mastigella vitrea* and *Arcella vulgaris*, in both of which the origin of nuclei from chromidia has been recorded. It is, however, far from clear that any such process occurs in these protozoa. Another illustration is found in *Rhinosporidium*, in which a contractile vacuole is said to be present. The recent exhaustive account of this organism given by ASHWORTH proves that true nuclei are present at all stages of development, and that neither a chromidial phase nor a contractile vacuole occurs. It is probably correct that some of the lower protists do not possess organized nuclei, but it is unfortunate that the author should have selected as illustrations cases which are by no means well established.

Having convinced himself that the peculiar bodies already mentioned are allied to the algae or other vegetable organisms he describes, he is in difficulties in the case of syphilis to account for the well-known spirochaete, which he assumes to be the detached flagellum of a hypothetical flagellate stage.

The book is evidently written in all earnestness and sincerity and the author has faithfully recorded what he himself has seen. The majority of observations quoted are, however, those of other workers; many of them still require confirmation, while some of them are undoubtedly incorrect. The inevitable result of the author's line of argument is that he has been led into making assertions that are based on superficial resemblances alone and which require far more evidence to support them than he has been able to adduce. It may be said, however, that as the etiology of many of the diseases discussed is still obscure, he may have rendered a service in directing attention to a conception which has been frequently overlooked.

C. M. Wenyon.

BUISSON (Jean). **Les Infusoires ciliés du tube digestif de l'homme et des mammifères.**—204 pp. With 60 text figs. 1923. Paris: Amédée Legrand, 93 Boulevard Saint-Germain. [Price not stated.]

This is in the main a descriptive catalogue, fully illustrated by unpretentious and somewhat diagrammatic figures, of the ciliate infusoria that inhabit the alimentary tract of mammals, man included. It appears to be a most useful treatise, and for beginners its usefulness is increased by a chapter of simple instructions for the study of these organisms, a list of hosts, and a working bibliography.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 5.

BLACKWATER FEVER.

i. Blanchard (M.) & Lefrou (G.). **Sur un spirochète trouvé dans le sang de cas de fièvre bilieuse hémoglobinurique et son action pathogène.**—*C. R. Acad. Sci.* 1922. Oct. 9. Vol. 179. No. 15. pp. 602–604.

ii. ——. **Présence de spirochètes dans le sang d'européens atteints de fièvre bilieuse hémoglobinurique. Le problème étiologique de cette spirochétose.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 699–722.

iii. Wenyon (C. M.). **Spirochaetes in Blackwater Fever: French Work in the Belgian Congo.**—*Lancet.* 1922. Dec. 23. pp. 1346–1347.

i. and ii. The first two papers deal with the same matter.

The authors note that hitherto the search for spirochaetes in blackwater fever has not been attended with much success. They record that Noc and Esquier [this *Bulletin,* Vol. 17, p. 369] found spirochaetes, 22–24 μ long, in the liver of a European who died of blackwater at Dakar, but this post-mortem discovery did not permit of any deduction, as the patient likewise harboured Plasmodium. The observation of Schüffner [this *Bulletin,* Vol. 13, p. 300] is more important. It relates to the case of a Javanese who, in the course of an attack of epidemic jaundice, developed haemoglobinuria and died. Examination of the blood showed rare *P. falciparum* and numerous spirochaetes morphologically identical with the *Spirochaeta icterohaemorrhagiae* of Inado and Ido. Inoculation into a guinea-pig produced only a slight rise of temperature, and transmission into other guinea-pigs failed. Schüffner considered that he was dealing with a new type, *S. icterohaemoglobinuriae.* Unfortunately, however, the case was not typical blackwater, and Blanchard and Lefrou state that the specific etiology of blackwater still remained unsolved.

Whilst engaged on their work on haemorrhagic jaundice and relapsing fever, the authors had occasion to utilize the method of triple centrifugation of the blood—a method in common use at Brazzaville for the diagnosis of sleeping sickness—and an opportunity arose to examine the blood of Europeans suffering from blackwater fever by the same method.

The exact technique used by the authors is as follows:—

About 10 cc. of venous blood was collected into a centrifuge tube containing 1 cc. of 20 per cent. sodium citrate solution sterilized in an autoclave, and the mixture well shaken to prevent coagulation.

The blood is then subjected to three successive centrifugations, each of a duration of about 10 minutes, in a hand centrifuge at a speed of 1,500 revolutions—about 65 turns of the handle per minute.

1. The first results in the separation from the plasma of the greater portion of the red cells. The centrifuge should be stopped when the liquid is separated into two distinct layers—the lower red consisting of erythrocytes and the other amber consisting of plasma.

2. Withdraw the supernatant layer by means of a pipette and teat and transfer to a second tube and centrifuge until there is a distinct light red deposit: this consists of red cells, leucocytes and platelets.

3. Decant, by pouring, the supernatant fluid into a third tube and centrifuge until a slight white deposit is obtained: this deposit, if the operations have been properly performed, consists only of platelets and an occasional red cell. It contains the spirochaetes.

This deposit is removed by a fine pipette, the tube being inverted and almost vertical, so as to have as little dilution as possible, and is examined either fresh by means of the ultramicroscope or after staining.

By means of this technique the authors succeeded in finding spirochaetes in the blood of two cases of blackwater fever. In the first case—a Swiss who had lived in the Congo for five years—the organisms were found on the fourth day of the disease, and in the second case—a Frenchman who had lived in the Congo since 1919—the spirochaetes were found also on the fourth day.

In preparations stained with Leishman the parasites were 6–9 μ long and 0·1–0·2 μ broad with three or four undulations. Certain specimens exhibited a series of nodosities suggesting very fine spirals, but this could not be further investigated in the absence of the ultramicroscope.

The deposit obtained by the triple centrifugation of the blood of the first patient on the fourth day of the disease was suspended in the patient's citrated serum and 1 cc. of this was inoculated into each of two guinea-pigs. The first, inoculated subcutaneously, died in 20 days without becoming infected; the second, inoculated intraperitoneally, died in 48 hours without icterus, haemoglobinuria or albuminuria, but scanty spirochaetes were found in its liver, which was emulsified and inoculated into guinea-pig 4. This animal died in 48 hours with distended abdomen, but without haematuria or icterus; spirochaetes were found in its blood and lungs, but not in the liver. The third passage resulted from inoculation of emulsion of the lungs into guinea-pig 6, which also died in 48 hours without icterus. The blood examined some hours before death showed numerous spirochaetes. The autopsy revealed the peritoneal cavity filled with blood, and the bladder was filled with bloody urine partially haemolysed; the kidneys were very congested and contained plugs; numerous spirochaetes were found in the blood and in the liver and a single one in the kidneys. By subinoculation the injection was carried on until the tenth passage, when it was lost. In a similar way guinea-pigs were infected from this patient on the eighth day of the disease and the infection was carried on to the fifth passage, when it was lost. Attempts to infect guinea-pigs from the second case on the fourth day of the disease failed.

Experiments suggest that the serum of the patient exerted a certain amount of protective action for guinea-pigs. Attempts at culture on artificial media failed.

In a table the authors contrast the characters of the following spirochaetoses: (1) Recurrent fever due to ectoparasites; (2) Tick fever; (3) Icterohaemorrhagica; (4) Yellow fever; (5) Bilious haemorrhagic fever of the Congo; (6) Infectious icterus of the Congo.

The conclusion is that blackwater fever appears to be a syndrome due to divers causes, amongst which *Spirochaeta biliohaemoglobinuriae* is a nosological entity.

iii. In this article Wenyon reviews the work that has hitherto been done on the subject of spirochaetes in blackwater fever. He points out that the observations recorded by BLANCHARD and LEFROU are certain to lead to many investigations along similar lines, so that we may confidently expect that very shortly the position of *Spirochaeta biliohaemoglobinuriae* in its relation to blackwater fever will be established.

W. Yorke.

CONNELL (R. E. W.). **A Case of Blackwater Fever complicated by Retinal Haemorrhage.**—*Jl. Trop. Med. & Hyg.* 1922. Dec. 1. Vol. 25. No. 23. pp. 378–379. With 2 charts in text.

The patient, a European, aged 26, had no tropical experience previous to his arrival in Uganda 16 months before his attack of blackwater. On 8th June, 1922, he had a severe attack of malaria (*P. falciparum*); he was discharged from hospital on June 12, and two days later developed blackwater fever. The illness was severe, haemoglobinuria lasting until June 20, when the patient complained of the vision of the right eye. On June 22 there was a rigor, and *P. falciparum* was again found in the blood. Euquinine, grs. 5, was given in the evening and three doses of the same amount next day; late in the evening there was a rigor and haemoglobin again appeared in the urine. On June 27 the temperature was normal and convalescence definitely set in.

The ocular symptoms began on June 20, when the patient complained of a dark spot in the centre of the eye, which at eight feet distance was found to cover a roughly circular area six inches in diameter. On June 22 the scotoma was larger but not so dense, and the eye was examined under atropine and a paracentral haemorrhage detected. The condition gradually improved, until on August 20 the haemorrhage could not be detected by the author.

W. Y.

PATRICK (Adam). **Notes on a Case of Blackwater Fever.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 451–455.

Details are given of a case of blackwater. The author refers to a number of questions raised by the reviewer recently in a critical review on the pathology of the disease [this *Bulletin*, Vol. 19, p. 631]. He shows that in the present case the specific gravity of the urine was between 1015 and 1025 during passage of blackwater. He further remarks that the serum was at the time dark red in colour. A further point of interest is the fact that an increase in the blood urea was noted at the end of quite a short period of suppression of urine.

W. Y

BECK (Rudolph). **Ueber Therapie und Pathologie des Schwarzwasserfiebers.** [On the Therapy and Pathology of Blackwater Fever.]—*Muench. Med. Woch.* 1922. Sept. 22. Vol. 69. No. 38. pp. 1381–1382.

A record is given of ten cases of blackwater fever observed by the author and by MÜLLERN, all of which were treated by the method recommended by MATKO [this *Bulletin*, Vol. 12, p. 358] i.e. by intravenous injection of 100–200 cc. of a watery solution containing 3 per cent. of disodium phosphate and sodium chloride : of the ten treated, nine recovered and one, who was moribund at the time of treatment, died. The author concludes from this that MATKO's method is a great advance in the therapy of the disease.

The exact manner in which the phosphate solution acts is still obscure. In contradistinction to paroxysmal haemoglobinuria autolysin is not found in the blood of blackwater cases. NOCHT has advanced the view that in the latter condition the haemolytic bodies are to be found in the internal organs, notably in the spleen. In support of this theory, reference is made to JOANNOVICZ's observation that toluylendiamine poisoning produces haemorrhages in normal animals, but if the spleen be previously removed then haemoglobinuria is observed. One cannot forget the long recognized fact that sometimes, in non-malarial cases, quite small doses of quinine (0·1 gm.) result in severe or even fatal haemorrhage from the skin, nose, mouth or intestine. FREUND, in the discussion which followed MATKO's paper, pointed out that in malaria during the fever the excretion of chlorine is doubled, but after the fever it is less than normal, as is also that of the phosphates. It is believed that leucocytes and muscle cells bind the phosphates for a time and so remove them from the blood. This results in striking osmotic anomalies in malaria, so that the smallest amount of a haemolytic substance may result in haemolysis. It is with the object of overcoming these osmotic changes that MATKO injects his disodium phosphate saline solution.

Since, however, the administration of lytic substances—quinine, antipyrin, phenacetin, methylene-blue—does not produce blackwater in every malarial case, the author entertains the view that, in addition, a special constitutional condition is necessary ; this must exist in the blood-forming or blood-destroying organs of which the spleen is the most likely. W. Y.

BOYÉ. **L'emploi du sérum anti-venimeux de Calmette dans le traitement de l'hémoglobinurie de la fièvre bilieuse hémoglobinurique.**—*Ann. de Méd. et de Pharm. Colon.* 1922. Sept.–Oct.–Nov.–Dec. Vol. 20. No. 3. pp. 334–341.

In a previous note [see this *Bulletin*, Vol. 2, p. 569 ; *Bull. Soc. Méd.-chir. de l'Indochine*, 10 Sept., 1911] a record is given of a case of blackwater in an Annamite in whom the haemoglobinuria disappeared some hours after injection of anti-venom serum of CALMETTE.

Details are here given of two further cases treated by the same method with equal success at Brazzaville : the first case had 10 cc. of the serum subcutaneously, and the second 10 cc. subcutaneously and six hours later 10 cc. intravenously. A little later, another case was similarly treated with 20 cc. of the serum subcutaneously, and here again the urine rapidly cleared. The author believes that the treatment is of great value in blackwater fever.

W. Y.

PLAGUE.

VASSALLO (S. M.). **A Report on Plague in the Bukedi District.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December,* 1921. pp. 96–99.

The plague infection is ascribed to *R. coucha* ("Nsolima") which first made a definite appearance in the district in 1919. [*Cf.* Plague: A Review, this *Bulletin,* Vol. 19, pp. 541–545.] It was brought to Mjanji in bags of rice which were sent to this district for famine relief. The bulk of the rice came from Jinja. The extensive cultivation of cotton in this district has provided the Nsolima with undoubted facilities for thriving. Cotton offers a very good nest and the cotton seed provides excellent nourishment. The natives state that this rat is bigger and stronger than "musonse" and "emende" previously found, and drives them away. Referring to the epidemic of 1920–21 the author writes:—

"The history of the epidemic is also quite clear. Three men, all Kavirondo, crossed over from Kenya in May 1920; one went to Sidukumi, where he died five days later, and another to Lumino, where he also died. The third man could not be traced. From the description of the disease both deaths were obviously due to plague, and it was from the death at Sidukumi that the outbreak dated."

. . . . .

"Treatment.—This is only of value in sporadic cases, as during epidemics time is much more usefully employed in preventing fresh cases and so saving the able-bodied." [Certainly! Prevention is of great importance but a properly prepared anti-plague serum in large doses and employed early will save many lives.]

"(1) Inoculation.—This I believe to be of no value; last year Bugwe and Samia were inoculated twice and in parts three times over, without in any way checking the disease. The same was noticed this year in Budama, and so inoculations were to a large extent discontinued." [*Cf.* BAKER (C. J.) and ALLAIN, this *Bulletin,* Vol. 19, pp. 368 and 370.]

The author found quarantine and the evacuation of infected houses with destruction of rats most useful in combating the outbreak.

J. H. Tull Walsh.

DOBREITZER (I. A.). **[Plague on the Russian Frontiers in 1920–1921.]**—*Hygiene & Epidemiol.* Moscow. 1922. Aug. No. 1. p. 92. (Russian Text.)

During the years 1920 and 1921 outbreaks of plague occurred in different border-regions of Asiatic and European Russia; a heavy outbreak in Manchuria (4,500 deaths) spreading to the Far Eastern Republic (E. Siberia and Maritime Province); smaller outbreaks on the Perso-Turkestan frontier, and in the Black-Sea region (Caucasus); another outbreak in the Kirghiz republic (Trans-Volga region).

The Manchurian epidemic originated in the steppes and, as in former years, was preceded by epizootics amongst different rodents, chiefly tarabagans (*Arctomys*), which transmitted the infection in the first place to Chinese trappers. It started at Khailar, and spread northwards, along the right bank of the river Argun; to the north-west, in the direction of Chita; and to the south-east—towards Vladivostock. In the Argun region 17 cases of bubonic plague occurred in the autumn of 1920, and 34 in February 1921. In the north-western direction a heavy epidemic of pneumonic plague broke out in the Dalai-Nor mines and in the settlement Manchuria (Manchouli) and lasted from

October 1920 till the middle of February 1921; altogether upwards of 2,000 cases were recorded. The south-eastern wave involved nearly the whole population of the province of Tsitsihar; it reached Kharbin in February 1921, where 1,000 cases were recorded, and Vladivostock (228 cases) in April. In summer the outbreaks ceased, but in August 1921 they recurred in the same regions.

On the Russo-Persian frontier 38 cases occurred in 1921; they were all confined to the region of Sarakhs (153 sq. miles). In the Caucasus 70 cases of bubonic plague were recorded in Batoum (1920) and 7 cases in Novorossiysk (1921). Infection was apparently introduced by ship from Constantinople.

In the Kirghiz steppes an epidemic lasted from July 1921, till February 1922. The number of cases was 23 (18 bubonic plague, 3 pneumonic, 1 pneumo-bubonic and 1 cutaneous).

C. A. Hoare.

ZABOLOTNY. **Die Pestherde in Südost-Russland und der Mandschurei.** [Plague Foci in South-East Russia and Manchuria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 12. pp. 380–383.

Gives statistics for several years in various foci around which epidemics occurred between 1899 and 1913. The author also describes the treatment adopted, including anti-plague serum. Prophylactic vaccination was carried out. For bubonic plague the serum was very useful and the death-rate was reduced to 10–20 per cent., half the previous figures.

J. H. T. W.

CHUN (J. W. H.). **Salient Points about the Recent Pneumonic Plague in Harbin.**—*Nat. Med. Jl. China.* 1922. June. Vol. 8. No. 2. pp. 71–82. With folding chart and 1 plan.

This paper was read to the National Medical Association of China, at Shanghai, in February, 1922. The author first points out that in the epidemic of 1910–11, 7,000 cases of pneumonic plague occurred in Harbin, all fatal. By 1920 a great change had taken place and a permanent anti-plague service existed. The Chinese authorities, the Russian doctors and the staff of the Chinese Eastern Railway also helped with such good effect that in the epidemic of that year only 54 deaths among the pneumonic plague cases occurred. [See this *Bulletin*, Vol. 19, p. 372. (WU LIEN TEH); p. 541–545 (Review of Plague).]

J. H. T. W.

JETTMAR (H. M.). **Erfahrungen ueber die Pest in Transbaikalien.** [Plague in the Trans-Baikal Country.]—*Ztschr. f. Hyg. u. Infektionskr.* 1923. Vol. 97. No. 3–4. pp. 322–329. With 1 map in text.

The author describes an outbreak of plague among the tarabagan hunters in 1920, which subsequently carried infection into Manchuria, causing the outbreak of pneumonic plague of 1921. The rodents implicated were *Arctomys bobac,* carrying the flea Ceratophyllus, *Spermophilus dahuricus* with *C. tesquorum,* and *Ochotoma dahurica,* also carrying species of Ceratophyllus, together with the steppe hamster and *M. musculus.* The mortality among these rodents when experimentally infected was high, especially among tarabagans.

J. H. T. W.

i. NIKANOROFF (S.). **A la question du rôle des chameaux dans l'épidémiologie de peste dans la région d'Astrakan.**—*Rev. Microbiol. et Epidémiol.* Saratov. 1922. Vol. 1. No. 2. pp. 178–179.

ii. ——. **Les souris comme porteurs de la peste.**—*Ibid.* Vol. 1. No. 1. pp. 71–72.

iii. ——. **L'épidémie de peste dans le rayon de Talovka de Kirghiz du mois d'août de 1921 au mois de janvier 1922.**—*Ibid.* Vol. 1. No. 1. p. 76. [All in Russian. Abridged versions in French.]

i. From results obtained with various methods of infection the author considers that camels may be subject to plague and may transmit the disease : (1) Subcutaneous inoculation with *B. pestis* produced bubonic plague and death in old or feeble animals ; (2) Ingestion of cultures produced diarrhoea, with swelling of lymphatic glands of the jaw when there was injury to the mouth. Two camels thus infected recovered completely and a third died at the end of 48 days ; at the autopsy lesions were found in the rumen, small gut and omentum ; (3) Infection by inhalation gave the most sure results ; all cases died with symptoms of plague pneumonia confirmed at autopsies.

ii. The author is fortunate in being able to record an epidemic which occurred in 1915 in the Ural District and clearly followed an epizootic among mice. Dead mice were found in large numbers in the bundles of hay which the peasants used for bedding in winter. *B. pestis* was found in these mice. Rats (*M. norvegicus*) were also dying from plague.

iii. During this epidemic in the Karamija region three families were infected. 23 persons suffered, of whom 6 recovered, 16 died and 1 was still ill when the paper was written. 18 of these cases were bubonic plague ; 3 pneumonic ; 1 with buboes and pneumonia and 1 with cutaneous lesions.

J. H. T. W.

HIRST (L. F.). **Summary of Researches on the Transmission of Plague by Fleas of the Genus Xenopsylla.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1922. Jan.–April. Vol. 19. Pt. 1. pp. 17–19.

The author writes :—

" The distribution of *X. cheopis* and *X. astia* on rats in their relation to plague within the City of Colombo has been specially investigated during 1921–22. The results are most interesting and may be summarized as follows :—

" *Hot weather collection* 1st April–31st July 1921 from all parts of the town :—

X. cheopis	nil.
X. astia	551

" *Cool weather collection* 24th November–14th February 1921–1922 :—

	X. astia.	*X. cheopis.*	*Per cent. cheopis.*
Plague area	791	167	17.43
Non Plague area	824	8	0.96
*Sea Street (January)	169	51	23.18
*Plague House in Sea Beach Lane (14th December) ..	48	41	46.0 "

X. brasiliensis has not been found in Ceylon.

[Hirst's results were considered in this *Bulletin*, Vol. 19, p. 542 : " Plague : A Review " ; see also CRAGG (F. W.), Vol. 18, p. 348.]

J. H. T. W.

---

* In centre of endemic zone.

HIRST (L. Fabian). **On the Transmission of Plague by Fleas of the Genus Xenopsylla.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 789–820. With 1 plate.

A detailed review of earlier work on investigations as to the transmission of plague infection by various fleas, with the author's records of plague in relation to the genus *Xenopsylla.* Areas in which plague was absent or slight produced more *X. astia* than *X. cheopis* or, as in the "off plague season," April 1 to July 31, 1921, in Colombo, *astia* only on the *R. rattus* and *R. norvegicus* examined by the author. The author concludes from his experience that: "If *X. astia* is not a true plague flea the relative immunity from plague of certain parts of Colombo, and many parts of India, where the rat fleas are nearly all of this species, is readily explicable." [*Cf.* CRAGG, this *Bulletin,* Vol. 18, p. 348.]

J. H. T. W.

SWELLENGREBEL (N. H.). **Moet aan de rat, in de epidemiologie van de pest, een minder belangrijke rol worden toegekend?** [Should a less Important Part be ascribed to the Rat in the Epidemiology of Plague?]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. 1st Half. No. 20. pp. 1968–1972.

The author disputes the views of HYLKEMA [this *Bulletin,* Vol. 19, p. 373], who thinks that in European plague epidemics the human flea may be the common transmitting agent.

In the minor transport of goods in the tropics the rat flea very probably is more important than the rat. But the rat flea (*X. cheopis*) is before all a parasite of the rat and will after transport with goods try again to find the local rats and eventually infect them with plague.

Experimentally the plague bacillus is found to be transmitted by the human flea and the bed bug, but there is no evidence yet of their importance under natural circumstances.

The recognition of rat plague offers considerable technical difficulties, especially if it concerns the more savage *Mus norvegicus.* Therefore it is of great importance that at last rat plague has been recognized in Paris.

If the human flea were responsible for the direct spread of plague from man to man, the author thinks the course of the former epidemics in Europe would have shown more likeness than it actually does to the explosive outbreaks of other diseases transmitted by human ectoparasites (typhus fever).

Pulex irritans, rare in the Dutch East Indies, is common in Bombay.* Plague, however, was never transmitted there in the native plague hospitals, though the patients are looked after by many friends and relatives carrying fleas.

Though theoretically the possibility of the human flea acting as a plague carrier must be admitted, the significance of the rat in the epidemiology of plague has not been derogated. Yet in practice it may be useful to reckon also with the human flea when planning measures against plague [*vide* BACOT, this *Bulletin,* Vol. 16, p. 45; also "Review," Vol. 19, p. 541.]

W. J. Bais.

---

* *Jl. Hygiene,* Vol. 7, p. 475; Vol. 8, p. 247, where it is stated:—"We had frequent opportunities for discerning this species of flea [*P. irritans*] in the houses we visited in Bombay, in some of which it was present in such large numbers that we had only to enter the houses for a few seconds to find our legs covered with them."

BORDAS, DUBIEF & TANON. **Quelques considérations sur la peste et sur les rats : le rat réservoir de virus.**—*Presse Méd.* 1922. Sept. 27. Vol. 30. No. 77. pp. 831–833.

There has been much discussion in Paris during the spring concerning plague and rats and some have thought it possible to predict the reappearance of the small epidemic stamped out in October [this *Bulletin,* Vol. 17, p. 392, GUINON (L.), etc. ; Vol. 18, p. 348, TEISSIER (P.), etc.] because some of the rats were still carriers. The contrary, however, has occurred. While there have been no more human cases the number of carrier-rats has increased.

Between July, 1921, and January, 1922, the authors found the plague bacillus in 29 rats out of 5,000 examined. The commonest sites in which *B. pestis* was found were the spleen, the liver and the lymphatic glands in the order given, the spleen containing the greatest number. Most of these carrier-rats were alive when they arrived at the laboratory. They showed no signs of illness and it is surprising that at the autopsy no typical lesions are seen as a rule. Buboes were seen in only 6 of the 29. Inoculations were made from these carriers into white mice, guinea-pigs and white rats. The white mice died after periods of 5 to 11 days, feverish and torpid ; the rats and guinea-pigs in 11 to 14 days, being much more resistant than the mice. These carrier-rats may give rise to an epizootic of rat plague under favourable circumstances, such as want or overcrowding, etc. Some think the passage of the bacillus through *X. cheopis* or other plague flea necessary, but of this proof is difficult, and the authors make the statement without further discussion.

J. H. T. W.

HOESEN (H. W.). [In Dutch & English.] **Gegevens omtrant de indicatoren der Rattepest op Java. Rat-plague Indicators on Java.** —*Meded. Burgelijk. Geneesk. Dienst. in Nederl.-Indie.* 1920. Pt. 8. pp. 2–89. With 2 maps.

Much of the work in this paper has been noted from other sources since 1920. The attempt to fix a mathematical relation between fleas and rats during epizootics is not of great practical value. According to the author direct indicators of rat plague are : Rats suffering from plague, human plague sufferers and fleas charged with plague bacilli. The first to be treated are the fleas. *Pygiopsylla ahalae,* which is a plague carrier and bites man [BACOT, see this *Bulletin,* Vol. 16, p. 45], was found in the villages on the slopes of Mount Wilis, and elsewhere in Java. In order to test the duration of infectivity of fleas a densely populated flea nursery was infected by a few plague-infected guinea-pigs. After the death of these animals fresh ones were put in. According to these experiments the rat-flea's infectivity was at Kediri : 1st series, 33 days ; 2nd series, 29 days. 42 and 38 days after the first experiments and 68 days after the second series, 235 fleas were pounded up and inoculated into animals without resulting plague. 13,481 fleas were obtained from various villages from 2,404 rats. From villages giving a positive result for flea infection an average of 522 fleas was inoculated for each guinea-pig that died of plague. The maps show places in which plague prevailed. The chart opposite page 66 gives the flea index.

J. H. T. W.

JOLTRAIN (E.) & DE GENNES (L.). **"La Peste." Formes cliniques diagnostic et traitement.**—*Ann. de Méd.* Paris. 1922. May. Vol. 11. No. 5. pp. 422–434.

An interesting, well-written paper dealing, in detail, with the various clinical forms of plague, their diagnosis and treatment. The epidemic to which the authors refer has already been noticed in this *Bulletin* [Vol. 17, p. 392; GUINON and others; Vol. 18, p. 348, TEISSIER (P.), and others.]

The authors are impressed with the value of anti-plague serum used in 100 to 200 cc. doses as early as possible: "Serotherapy in the bubonic form should save the patient if employed early. To a delayed diagnosis, or a too timid treatment, must be attributed many fatal cases." The authors consider that the search for precipitins is too delicate a test to be of practical value.

J. H. T. W.

MATHIS (C.). **Réceptivité du nourrisson à la peste septicémique.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 920–926.

The author states that there is little recorded concerning plague in infants. He quotes MAHÉ, LE DANTEC, SIMOND, etc., to show that children under five years rarely suffer from recognizable plague. Dr. Mathis agrees with most authors that buboes are rare in infants under five years of age. Out of 47 infants dying of plague (MENAUT and BOUVAIST) buboes were only found in two, one aged eight months and the other four years.

J. H. T. W.

LOMBARDO (G.). **Su la polmonite nei pestosi.**—*Pathologica.* 1922. Aug. 15. Vol. 14. No. 330. pp. 498–502.

The cases are of importance as showing how difficult it may be to detect sporadic cases of pneumonic plague, especially when mixed with pneumonia due to the pneumococcus. In November, 1920, a young girl died in six days with symptoms of croupous pneumonia and there was no suspicion of possible danger to others from infection. Eight days later the mother died with similar symptoms; and the father died after seven days. Bacteriological examinations showed pneumococci in the lungs, plague bacilli in the spleen; there was enlargement of the inguinal glands not amounting to buboes. The author gives a fairly long list of papers on pneumonic plague.

J. H. T. W.

LEGER (Marcel) & LHEURRE. **Persistance anormale du bacille de Yersin chez un pesteux bubonique.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 759–762.

"The easy destruction of the plague bacillus is a classical idea: destruction by light, by heat, by antiseptics. The germ, write JEANSELME and RIST (Précis de Pathologie exotique, p. 224), disappears early from the suppurated buboes, where we find generally only the common staphylococci." Other quotations occur to the same effect.

"The following case seen recently by us in the Indigenous Hospital for Instruction, Dakar, leads to counsels of reserve:—

"D.K., aged 28, guard, working at Conakry (French Guinea) disembarked at Dakar, May 13th, 1922. He formed part of an escort bringing prisoners from Conakry. He lodged with the warders of the Dakar jail. On May 20th, D.K. was admitted to hospital with a voluminous glandular swelling in the right groin. Temperature 37·8° C. Pulse 88. No lesion found in leg or groin through which infection might have entered. The bubo was at once punctured and coco-bacilli resembling Yersin's bacillus were found. Between the 21st and 25th May the patient received intravenous injections of anti-plague serum: 60 cc. on the 21st, 23rd, and 25th. The temperature fell after the first injection and remained normal. The wound in the bubo was washed with permanganate of potassium 1/1000 and dressed at first with ether iodoform and later with Reclus ointment. On June 27th D.K. was considered cured, clinically. A bacteriological examination made on June 28th showed that *B. pestis* was still present. A first culture was spoiled by the invasion of *B. subtilis*. A second and third culture made from the patient gave *B. pestis*. With the serum of D.K. agglutination 1 : 20 took place; but no agglutination with serum taken from other men. One *M. rattus* and one white rat were inoculated: they died on the ninth day. Thus such a case may become a chronic 'carrier.'"

J. H. T. W.

Gonzaga (A. Gavião). **Importancia da hemocultura para o diagnostico da peste. Frequencia da pesticemia.** [The Importance of Blood Culture in the Diagnosis of Plague. Frequency of *B. pestis* Septicaemia.]—*Brazil Médico*. 1922. Feb. 11. Year 36. Vol. 1. No. 6. pp. 69–73. With 6 text figs.

Bacillus pestis occurs in the blood in ordinary bubonic plague, and blood culture should, therefore, be employed as a means of early diagnosis of the disease. The bacillaemia is not, as is generally believed, merely a terminal event.

Six cases are quoted in some detail, examples of a number under the author's care. Positive cultures were obtained from each and in two patients who came under observation early the buboes did not appear until 48 hours after the positive blood specimens were taken. All six made a good recovery, thus showing that the bacillaemia does not warrant a gloomy prognosis.

H. Harold Scott.

Pergola (M.). **Contributo all'importanza della termoprecipitazione nell' accertamento diagnostico della peste.**—*Policlinico*. Sez. Med. 1922. Nov. 1. Vol. 29. No. 11. pp. 610–614.

Records assistance in diagnosis given by the "thermoprecipitin" test in a case following two, in the same family, from pneumonia. A girl died of pneumonia, but only pneumococci were found; the mother was next attacked and died, but again only pneumococci. When the father became infected and died the author suspected plague infection and resorted to the search for a specific "precipitin," with positive result [*cf.* Joltrain, above.].

J. H. T. W.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1921.**—[LISTON (William Glen.), Director.]—8 pp. 1922. Bombay, Govt. Central Press. [Price 2½ annas.]

Since the opening of the laboratory in 1896, 21,142,100 doses of anti-plague vaccine have been sent out. This number includes 823,230 doses sent out during 1921. The dose of vaccine is reckoned as 4·0 cc., but when used within three months of the date of manufacture a dose of only 3·0 cc. is recommended. During 1921, 698,647 rats were received; of this number 215,511 were alive and 483,136 were dead. Of the latter number 347,386 were examined and 11,721 were found to be infected with plague. The human plague mortality was 677.

[For notice of Report for 1920, see this *Bulletin*, Vol. 19, p. 733.]

J. H. T. W.

LEGER (Marcel) & BAURY (A.). **Sur un Coccobacille pseudo-pesteux extrêmement virulent.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 862-865.

This is a Gram-negative microbe resembling morphologically the plague bacillus of YERSIN; but it does not cause epidemic disease although it is as fatal for rabbits and other rodents, if not more virulent, than virulent plague bacilli.

" The germ that we have isolated from a miliary abscess of the kidney in a negro from Senegal is neither the plague bacillus, nor one of the pathogenic *Pasteurella* described from man, in particular *P. Bouffardi* which in Senegal causes multiple abscesses, often fatal: nor is it the cocco-bacillus " en navettes " [shuttle-shaped] formerly found by us in the blood of a man who died of suppurative hepatitis. We have not been able to identify it with any known bacillus." They call it *B. pessimus* (n. sp.).

J. H. T. W.

HYLKEMA (B.). [*Bacillus pseudotuberculosis rodentium* **et la peste chronique.**]—**Extrait du Rapport sur l'activité du Laboratoire central d'Hygiène publique des Pays-Bas pour 1921, publié dans** *Versl. en Mededeel. betr. de Volksgezondheid.* 1922. July. p. 553. [Summarized in *Bull. Office Internat. d'Hyg. publique.* 1922. Aug. Vol. 14. No. 8. p. 957.]

Relates in general to pseudotuberculosis in rats and in particular to one rat from a ship in the port of Rotterdam. Diagnosis of pseudotuberculosis was in this case confirmed by inoculating guinea-pigs in which the usual lesions were reproduced. A culture of *B. ps. rodentium* was made from the spleen of this rat and was virulently fatal to white mice, but in these animals it produced pathological conditions resembling plague. Moreover from their organs a bacillus was obtained indistinguishable from *B. pestis.*

[Is it not possible that the plague bacillus was present in the rat referred to as well as that of pseudotuberculosis? See Sectional Editor's note to URIARTE (L.), Vol. 19, pp. 726-727; also de FARIA.]

J. H. T. W.

i. FUSCO (G.) & PATANÉ (C. G.). **Sulla fina struttura del bacillo della peste. (Nota preventiva.)**—*Pathologica.* 1922. Sept. 15. Vol. 14. No. 332. p. 570. With 1 text fig.

ii. ALLAIN. **La seconde épidémie de peste de Tananarive (novembre 1921–février 1922).**—*Ann. de Méd. et. de Pharm. colon.* Paris. 1922. Sept.–Oct.–Nov.–Dec. Vol. 20. No. 3. pp. 308–333.

iii. McCOY (George W.). **Some Features of Plague.**—*U.S. Nav. Med. Bull.* 1922. Sept. Vol. 17. No. 3. pp. 386–394.

iv. LHUERRE (H.). **La Peste à Dakar : Étude clinique et thérapeutique. Période endémo épidémique : Octobre 1921–Octobre 1922.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 874–906.

v. WU LIEN TEH, CHUN (J. W. H.) & POLLITZER (R.). **Clinical Observations upon the Second Manchurian Plague Epidemic, 1920–1921.**—*Nat. Med. Jl. China.* 1922. Dec. Vol. 8. No. 4. pp. 225–255.

i. The authors state that ammoniacal solution of methylene blue brings out granules in the body of *B. pestis* as well as at the poles. The microphotograph shows this well.

ii. This report is on the same lines as that on the first epidemic. [Cf. this *Bulletin* Vol. 19, p. 370. De GOYON & ALLAIN ; 370–371, ALLAIN.]

iii. Treats of plague generally. A lecture delivered at the U.S. Naval Medical School Washington D.C.

iv. This is an interesting paper reviewing the work of others from 1914 onwards and giving personal observations of 76 cases. [Plague epidemics in Dakar have already received notice, *vide* this *Bulletin*, Vol. 17, pp. 390–391 (ESQUIER ; AMBROSE) ; Vol. 19, p. 367 (TEPPAZ & NOC), p. 368 (RIGOLLET).]

v. This is a detailed report from the Plague Prevention Service Laboratory, Harbin ; interesting, but not new.

J. H. T. W.

CHUN (J. W. H.). **Pneumonic Plague in Harbin (Manchurian Epidemic, 1921).**—*China Med. Jl.* 1923. Jan. Vol. 37. No. 1. pp. 7–17. With 1 text fig.

LEGER (Marcel) & BAURY (A.). **Porteurs sains de bacilles pesteux.**—*C.R. Acad. Sci.* 1922. Oct. 23. Vol. 175. No. 17. pp. 734–736.

NEGRONI (P.). **I vantaggi della preparazione del siero antipestoso col metodo Lustig-Galeotti.**—*Boll. dell' Istituto Sieroterapico Milanese.* Milan. 1922. Aug. 30. Vol. 2. No. 5. pp. 247–252.

OHTSUKI (Manjiro). **[On the Pathological Anatomical Findings of Pulmonary Plague occurring in North Manchuria in 1921.]**—*Jikken Igaku Zasshi* (*Jl. Experim. Med.*). 1922. May. Vol. 6. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2. No. 10. p. 299.]

THOULON. **Les attitudes dans la peste.**—*Bull Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. July. Vol. 2. No. 7. pp. 194–195.

CHOLERA.

HEHIR (Patrick). **The Cholera Epidemic in the North-West Frontier Force, 1919.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 136–155. With 1 chart.

A well-written account of a cholera epidemic which consisted of outbreaks at various centres. The table on page 138 supplies all the necessary statistical information. It shows that 56 British troops, 504 Indian troops and 1,103 followers were attacked, and that the death-rate in these was 67·5 per cent., about twice that of the troops.

" The supply of ROGERS's hypertonic infusion apparatus to every hospital, with a reserve in the advance depots of medical stores, was a noteworthy feature of the medical arrangements made by G.H.Q.; it is not possible to exaggerate the great utility of this outfit and the marked effect it had on the mortality when it was used early."

The Force Bacteriological Laboratory was at Peshawar, and General Hehir writes: " The excellent work done by this unit was of the highest value to us." Two good portable bacteriological laboratories were also provided.

" The arrangements for the supply of anti-cholera vaccine were made by General Headquarters and must have been perfect. Our force was supplied with 300,000 double doses in about three weeks. I always kept 5,000 double doses in my personal charge to meet any emergency arising; each advanced depot of medical stores kept a reserve in stock."

J. H. Tull Walsh.

BLOCH (T. S.). [**Cholera in Russia in 1920–21.**]—*Hygiene and Epidemiology.* Moscow. Aug. 1922. No. 1. p. 77. (Russian Text.)

The recent cholera epidemics are traced to 1904, when infection was introduced from Persia to the Transcaspian region. The 18 years' chain of epidemics that followed is divided into two periods: from 1904 to 1913, and from 1914 to the present.

The first period reached its maximum in 1910, when 230,232 persons in 72 provinces were affected; in 1912 the wave fell to a minimum of 9 cases in two provinces. The year 1914 marks the beginning of a new rise. The redistribution of the mobilized population for war created favourable conditions for the dissemination of cholera. The south-western front was the region most affected (7,768 cases in the army). In 1915 the epidemic spread from the army to the civil population, the number of cases rising to 44,400. In 1916 and 1917 there was a fall, attributable partly to better sanitary conditions in the army, but chiefly to compulsory anti-cholera vaccination. In 1918 the epidemic again rose high (41,247 cases), and spread over 37 provinces in all parts of Russia. In 1919 the outbreaks subsided (3,830 cases); but remained distributed over a wide area.

In 1920 cholera was prevalent all the year round, with two maxima—in March and in August. The number of cases recorded was 25,711,* distributed all over European Russia, Middle Asia (Turkestan), part of Siberia (Tomsk Province), and the Caucasus. The movements of armies and refugees during the civil war favoured dissemination.

---

* This figure does not include the incidence in the Red Army.—C. A. H.

The most characteristic feature of the epidemics in 1919–20 was the abundance of winter outbreaks.

In 1921 Russia experienced one of the severest outbreaks of cholera in the present century, second only to the epidemic of 1910. The chief foci were in the South-east (Transvolga Provinces) and in Central Russia (Voronej Province). Altogether 207,389 cases were recorded, with a death-rate of 44·8 per cent.

No infections were traceable to water, and the author thinks this may be due to a biological degeneration of the cholera vibrio. The chief sources of infection were presented by refugees fleeing from the famine-stricken area ; demobilized soldiers, and food-smugglers ; and the disease spread along the routes of travel by contact [?] especially along the rivers (Volga).

The clinical course of cholera in 1920 and 1921 was atypical, a definite association with typhus and relapsing fever being observed.

C. A. Hoare.

MUTERMILCH (Stefan). **Epidemja cholery w Armji Polskiej i wśród jeńców bolszewickich w 1920–1921. Description de l'épidemie du choléra dans l'Armée Polonaise en 1920–1921.**—*Przegl. Epidemjol.* Warsaw. 1922. Vol. 2. No. 1. pp. 92–104. [French summary p. 105.]

Number of cases of cholera	991
Deaths	547 (55 per cent.)

Two hundred and sixty eight (27 per cent. of total cases) were found to be healthy carriers.

J. H. T. W.

GOSS (M.). **Choléra sans vibrions (bactériolyse et collapsus).**—*Bull. de l'Administration sanitaire des Frontières.* Constantinople. 1922. Oct. 5. No. 25. pp. 541–543.

The summer and autumn epidemic of 1920–21 in Russia was generally mild in type, although hundreds and, rarely, thousands suffered. It remained mild until June, 1922, when it became more virulent. This change occurred after a period of famine, but the author does not think lack of food had much influence on the change of type ; he says the causes of increased virulence "are not known" One striking fact observed by the author was that: "in some cases, evidently clinically cholera, cases evolving rapidly with the character of 'foudroyant' cholera, he failed to find any vibrios in the small intestines." This perplexed him, as indeed it might! His explanation is: "probably the gravity of these cases, their sudden evolution, accounts for the absence of vibrios." "The toxins of the cholera vibrio, true endotoxins, are strongly bound up in the bodies of the microbes and only appear in the surrounding fluids and tissues after the destruction of the microbes, after their dissolution (bacteriolysis)." [This is such an unusual condition, since the stools of cholera patients generally swarm with vibrios, that it is unfortunate the problem was not solved.]

J. H. T. W.

TSURUMI (M.) & TOYODA (T.). **Cholera Acidosis and its Therapy.**—*Arch. Intern. Med.* 1922. Dec. 15. Vol. 30. No. 6. pp. 797–800.

1. The alkali content of the blood in mild cases of cholera is practically the same as in health. But in severer, and especially in serious cases, a marked decrease of alkali is observed, leading to acidosis.

2. By intravenous injection of alkali (sodium bicarbonate) the blood alkali in cholera is generally increased, temporarily or permanently; that is to say, the number of drops by the stalagmometer (according to Traube's method) increases. The occasional decrease is believed due to increased acid produced in the body and to the great increase of tolerance to alkali in consequence of acidosis in an acute form.

3. The mortality after the injection of sodium bicarbonate saline in 49 cases was 28·4 per cent., while the mortality in 480 cases in which no alkali was given, but saline only, serum, or both, was 42·7 per cent.

J. H. T. W.

SELMON (A. C.). **A Case of Cholera Gravis with Complications.**—*Jl. Amer. Med. Assoc.* 1922. Dec. 2. Vol. 79. No. 23. pp. 1930–1931.

The details of this very interesting and instructive case are :—

Patient, a Chinese woman, aged 35, eight and a half months pregnant, with an active tubercular lesion in one apex and recent haemoptysis. Acute cholera symptoms appeared on Monday night (no date given); rice water stools and much vomiting on Tuesday; almost complete anuria, torturing pains in the calf of the leg, with an uncomfortable, dry, parched feeling in the nose. Mouth temperature 38·5° C., pulse 108 and barely perceptible. Three litres of hypertonic saline were given, made up of sodium chloride 16 gm., potassium chloride 0·8 gm., calcium chloride 0·55 gm., water 1 litre. The temperature of the flask was kept at about 38° C. (100·4° F.). During transfusion the patient became more quiet and the pulse improved markedly. In addition, potassium permanganate 0·13 gm. made up with kaolin and petrolatum into a pill coated with phenyl salicylate; one pill every half-hour for six hours. The stools showed marked improvement after this treatment.

Early on Wednesday morning the patient gave birth to a well-developed stillborn child. No difficulty was experienced in delivery and the blood lost was negligible. Following delivery there was improvement for a few hours and then suddenly exacerbation of cholera symptoms, more severe in the relapse than during the primary attack; systolic blood pressure dropped to 75 mm. An isotonic saline solution was slowly injected into a vein for several hours: two and five-tenths litres in five hours. Artificial heat was applied and another course of 12 potassium permanganate pills. There was prompt improvement in the stools. As the patient rallied the flow of urine started again after having ceased for almost twelve hours. No food of any kind was allowed until 24 hours after the relapse started. Convalescence was complicated with severe gastritis and myocarditis. The stools contained numerous cholera vibrios. The urine passed during the attack had a heavy content of albumin.

J. H. T. W.

i. KABESHIMA (Tamezo). **[On the Fate of Vibrio Cholerae in Pfeiffers's Phenomenon.]**—*Nihon Biseibutsugakkwai Zasshi* (*Jl. of Japan Microbiol. Soc.*). 1922. July. Vol. 16. No. 7. [Summarized in *Japan Med. World.* Tokyo. 1922. Dec. 15. Vol. 2. No. 12. p. 352.]

ii. OHTSUBO (Itsuya). **[Contributions to the Iod-Phenomena in Cholera Vibrio Cultivation.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1922. Aug. No. 323. [Summarized in *Japan Med. World. loc. cit,* p. 354.]

i. The author's note is not very clear but conveys the idea that there is a doubt, in his mind, as to the bactericidal action of guinea-pig serum [*cf.* SANARELLI, this *Bulletin,* Vol. 17, p. 401 ; Vol. 19, p. 379.]

ii. In the culture of cholera vibrios a substance that absorbs iodine was found. Albumins that take the iodine colour are digested by the vibrios. The beautiful halo produced in a medium containing starch and iodine is due to digestion of starch by the vibrio [see this *Bulletin,* Vol. 19. p. 380.]

J. H. T. W.

KABESHIMA (Tamezo). **[On Pepton Water of the Proliferation of** *V. cholerae.*]—*Nihon Biseibutsugakkwai Zasshi.* (*Jl. of Japan Microbiol. Soc.*). 1922. May. Vol. 16. No. 5. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 322.]

The author suggests the following precautions when using commercial peptone. Some peptone sold has a strong acid reaction, while other samples are slightly acid : *e.g.*, " Gehe peptone water " presents such a strong acid reaction that it would almost inhibit the growth of *V. cholerae.* Peptone which requires more than ten degrees phenolphthalein or more than 1·4 per cent. soda to neutralize is no use for culture of cholera vibrios.

J. H. T. W.

KO-RAN. **Special Culture Medium for Cholera Asiatica prepared after a New Method.**—*Taiwan Igakkwai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1922. July. No. 223. (English summary p. 4.) [In Japanese, pp. 35–38.]

The ingredients are :—

Peptone (Witte or Teruuchi) ..	3·0 gm.
Salt	0·5 gm.
Distilled water	10·0 cc.
Agar	3·0 gm.

Dissolve thoroughly by heating, then mix separately :—

Casein or Nutrose	0·5 gm.
Distilled water	10·0 cc.
10 per cent. solution of carbonate of soda (anhydrous)	2·0 cc.

After heating add to the agar solution with 0·1 cc. saturated alcoholic solution of fuchsin. Grown on this medium colonies of cholera vibrios can be distinguished at a glance from *B. coli* and other intestinal bacteria which always accompany them.

J. H. T. W.

SHUNJI (Masaki). **[On the Mechanism of Cholera Infection and on Cholera Immunization per os.]**—*Keio Igaku* (*Keio Med. Jl.*). 1922. June. Vol. 2. No. 6. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 330.]

Living cholera vibrios were administered to rabbits and guinea-pigs either by the mouth or by inoculation. The injected vibrios passed via the intestinal walls into the small gut, where they proliferated. They then reached the blood through the weakened intestinal tissues. Vibrios administered by the mouth did not produce any effect on the body (bacillaemia). The rabbit sensitized with cattle bile when given either killed or living bacteria produces serum which agglutinates vibrios, the stronger agglutination following doses, *per os*, of killed vibrios.

J. H. T. W.

MASHIMO (Shinichiro). **Cholera Bacteriemia and Appearance of its Bacteria in Bile (Preliminary Report.)**—*Japan Med. World.* Tokyo. 1923. Jan. 15. Vol. 3. No. 1. p. 10.

The author describes some experiments in which bacteriaemia with *V. cholerae* was produced and the vibrios recovered from the bile. Rabbits were used. A virulent culture suspended in physiological salt solution was injected and bile was drawn off through an artificial fistula under aseptic precautions. The lethal dose was 8 mgm. per kilogram of body-weight of rabbit. The vibrios were recovered from the bile in two minutes after the intravenous injection.

J. H. T. W.

SIROTININ (N.). **Zur Frage ueber den Einfluss des** *B. proteus v.* **auf den Gang der Cholerainfektion.** [Influence of *B. proteus v.* on the Course of Cholera Infection.]—*Rev. Microbiol. & Epidemiol.* Saratov. 1922. Vol. 1. No. 3. p. 290.

Rats were infected (1) with *V. cholerae* only, with a 40 per cent. mortality; (2) with *V. cholerae* + *B. proteus v.*, with a death-rate of nearly 80 per cent; and (3) with *B. proteus v.* only. The mortality was slight; but the author thinks that when present it increases the virulence of the cholera vibrios.

J. H. T. W.

CIUCA (M.). **Présence de principe lytique pour le Bacille de Shiga et le Colibacille dans les selles des cholériques.**—*C.R. Soc. Biol.* 1923. Jan. 20. Vol. 88. No. 2. pp. 143–145.

The results of the author's work show "that the intestinal contents in cholera cases, rich in leucocytes, favour the secretion of a body lytic in action against *Bacillus coli* and Shiga's bacillus." "There is no relation between the evolution of the disease and the presence of this principle."

J. H. T. W.

MACKIE (T. J.). **The Serological Relationships of the Paracholera Vibrios to** *Vibrio cholerae*, **and the Serological Races of the Paracholera Group.**—*Brit. Jl. Experim. Path.* 1922. Oct. Vol. 3. No. 5. pp. 231–237.

This paper reviews the work of others and contains original agglutination experiments by the author. The paracholera group represents a considerable number of races differentiated by agglutination reactions.

V. cholerae antiserum exhibits apparent co-agglutination under certain conditions towards *V. paracholerae* A and similar types. A short bibliography is given [*cf.* this *Bulletin*, Vol. 19, p. 738 (KABESHIMA); p. 739 (ODA): Vol. 18, p. 353 (DOUGLAS); p. 69 ("Critical Summary").]

J. H. T. W.

WARASI (W.). **Pathologische Veränderungen der Muskeln bei Cholera asiatica.** [Pathological Alterations of Muscle in Cholera.]—*Deut. Med. Woch.* 1922. Oct. 13. Vol. 48. No. 41. p. 1387.

The author opposes KRAUS's dictum that there are neither macroscopic nor microscopic changes in cholera muscle. He found in early cases of cholera that muscle showed cloudy swelling and waxy (? amyloid) degeneration somewhat similar to the conditions noticed long ago by ZENKER in typhoid fevers.

J. H. T. W.

i. BANERJI (Dhirendra Nath). **A Note on the Total and Differential Leucocyte Counts in Healthy Bengalees and in Cholera.**—Reprinted from *Calcutta Med. Jl.* 1922. Apr. 10 pp.

ii. ——. **Arneth Blood Count in Health and in Cholera.**—*Ibid.* 1921. Dec. Vol. 16. No. 6. 11 pp. With 1 plate.

i. The author gives a list of the proportional number of leucocytes given by many workers. Of these the most important are the figures of ROGERS (7,500 per cmm.) and MCCAY (9,000), since they refer to Bengalis. Dr. Banerji's standard is 7,698, with maximum 10,000 and minimum 5,600.

Differential counts of average healthy Bengalis show slight increase in large mononuclears and eosinophiles.

Poly.	*Large Mono.*	*Small Mono.*	*Eosino.*
67·22	9·67	18·42	4·69

Differential counts of cholera cases show marked increase of mononuclears and proportional decrease of lymphocytes, which is peculiar to cholera. The average being:—

Poly.	*Large Mono.*	*Small Mono.*	*Eosino.*
72·55	16·83	10·03	0·59

Cholera cases show marked leucocytosis not incompatible with recovery. The majority of cases give 10,000 to 30,000 with no relation to the concentration of the blood.

ii. The plate shows the five classes in Arneth's system (after GRÜNER) and is taken from the *British Jl. of Tuberculosis.* 1917. Vol. xi.

1. Normal Arneth pictures from healthy Bengalis show a definite shift to the left—average index 52·55.

2. In cholera there is a well-marked shift to the left, the average being 71·9.

3. The Arneth index is of use in determining the severity of the disease—average of fatal cases 81·30.

J. H. T. W.

ZABOLOTNY (D. K.). **[The Practice of Anti-Cholera Vaccination *per os*.]** —*Hygiene and Epidemiol.* Moscow. 1922. Aug. No. 1. p. 73. (Russian Text.)

Anti-cholera vaccination *per os* is regarded by the author as more efficient and practicable when immunization of large numbers is required. It was widely used during recent epidemics in Russia.

The author recommends the use of vaccines prepared from thick suspensions of organisms killed by heat, carbolic acid or alcohol (20–40 per cent.), from 3 to 5 doses of 2–100 cc. every other day. Each dose contains from 10 to 100 milliard vibrios, or from 0·01 to 0·1 gm. of dried organisms.

Vaccines were also prepared in the form of tablets with sugar or cocoa, each containing 0·01, 0·05 or 0·10 gm. dried organisms.

According to ZLATOGOROV and SAVCHENKO, in persons inoculated by mouth the agglutination titre rises to 1/400, and the bactericidal to 1/60. From experiments on themselves, they found that after immunization by mouth, the preventive properties of the serum increased considerably, and the inoculation of living cultures produced no pathogenic symptoms, only a short period of " carriage " of vibrios resulted.

Guinea-pigs could be protected from lethal doses by inoculating them with the serum of persons who had been immunized with killed agar suspension of vibrios. [It would be interesting to know how long the protection lasts.]

C. A. Hoare.

OYAMA (Ryo) & YANAGISAWA (Sanji). **[On the Preservation of the Efficacy of Cholera Sensitized Vaccine and Typhoid Vaccine.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1922. May. No. 320. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 321.]

The authors state that cholera sensitized vaccine preserved its full antigenic power for 13 months; after that time it becomes weaker. In experimental tests a two-year-old vaccine was found to protect inoculated animals against twice the ordinary lethal dose.

J. H. T. W.

i. CAPONE (G.). **Di uno stipite di colera a colonia atipica e spontaneamente agglutinabile.** [A Strain of *V. cholerae* with Atypical Colonies spontaneously Agglutinable.]—*Boll. d. Istituto Sieroterapico Milanese.* 1920. Apr. No. 5. pp. 297–300. [Received October 16, 1922.]

ii. ALALOU (M.). **Le vibrion cholérique de Tchilinguir.**—*Bull. Sanitaire de Constantinople.* 1922. Nov. 2 & 25. Nos. 1 & 2. pp. 1–4. With 1 plate.

iii. STUTZER (M. I.). **Biologie der choleraähnlichen Vibrionen, die während der Epidemie 1921 in Woronesch nachgewiesen wurden.**—*Rev. Microbiol. & Epidemiol.* Saratov. 1922. Vol. 1. No. 3. p. 286.

iv. KODAMA (H.) & TAKEDA (H.). **Eine neue biologische Reaktion der Choleravibrionen.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Sept. 1. Vol. 88. No. 7–8. pp. 513–518.

i. The author suggests that this strain was the result of a mutation as understood by De VRIES.

ii. This is one of the several atypical vibrios differing from type in agglutination, etc. It does not produce haemolysis.

iii. The vibrios described were a local strain which did not agglutinate with type anti-cholera serum but produced clinical cholera.

iv. This has already been noticed in this *Bulletin*, Vol. 19, p. 380. The German paper contains more details.

J. H. T. W.

BERTARELLI (E.) & MARCHELLI (M.). **Ricerche intorno alla durata di attività dei vaccini anticolerico e antitifico.**—*Boll. d. Istituto Sieroterapico Milanese.* 1919. Apr. Vol. 2. No. 3. pp. 157–167. [Received Oct. 16, 1922.]

DELAMARE (Gabriel). **Choléra et porteurs de vibrions dans la région de Constantinople de 1920 à 1922.**—*Bull. Acad. Méd.* 1922. July 25. 3rd Ser. Vol. 88. No. 30. pp. 98–100.

LAMPE (Petrus Hendricus Josef). **Vergelijking van vibrio cholerae en vibrio El-Tor.**—68 pp. 1922. Amsterdam : S. L. van Looy.

SASKI (Stanislaw). **Cholera azjatycka w wojsku na obszarze wojennym w roku 1920–1921. Le choléra asiatique dans l'Armée Polonaise dans la zône des Armées et des Etapes en 1920–1921.**—*Przegl. Epidemjol.* Warsaw. 1922. Vol. 2. No. 3. pp. 339–344. [French summary p. 345.]

YOMANOUCHI (Tatsuma). [**On the Diagnosis of** *V. cholerae.*]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. of Japan Microbiol. Soc.*). 1922. May. Vol. 16. No. 5. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15 Vol 2. No. 11. p. 322.]

ENTERIC FEVERS IN THE TROPICS.

BERTHÉLEMY & LE BOURDELLÈS. **Quelques cas de fièvre typhoïde dans la race noire confirmés par l'hémoculture.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 67–70.

The authors state that the negro race is generally supposed to be immune to typhoid fever. They give an account of eight cases which occurred among the soldiers of the 136th Bataillon de Tirailleurs Sénégalais. Haemoculture was positive in six cases for *B. typhosus*, and in the other two *B. paratyphosus* A was isolated. Three of the six suffering from typhoid died; the rest recovered.

J. H. Tull Walsh.

BOUFFARD & GIRARD. **La fièvre typhoïde chez le malgache en Emyrne.** —*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 675–678.

The authors recognize that typhoid fever has been known in Madagascar since its conquest, but they raise the ancient question as to whether natives suffer or whether true typhoid is generally confined to Europeans. That *B. typhosus* spread to the east with the conquests and settlement of Europeans is perhaps generally true, but the East and Western tropics always contained the paratyphoid germ [v. "The Practice of Medicine in the Tropics," Vol. 2, p. 955, *et. seq.* (HARVEY & WALSH).] In the cases cited by the authors the germ discovered was one or other of the paratyphoids.

J. H. T. W.

BACHMANN (Alois). **Sobre la presencia de bacilos Para B anómalos en Tucumán.**—*Rev. Inst. Bacteriolog.* 1922. Dec. Vol. 3. No. 2. pp. 3–15. (French summary pp. 15–16.)

During an outbreak of enteric fevers in the provinces of Cordoba and Tucuman *B. typhosus* was found in 80 per cent., para. A in 12 per cent., and para. B in 8 per cent. Many of these para. B were atypical, a condition frequently found.

J. H. T. W.

DUFFAU (H. E.). **Fièvre typhoïde et bactériothérapie.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Mar. Vol. 2. No. 1. pp. 59–66. With 9 charts in text.

The main argument may be briefly stated. A military detachment was transferred from X to T. *En route* the men halted on the 8th December at N, a place notorious as a typhoid focus with contaminated water supply. On December 20 most of the men received 2 cc. of Vincent's T.A.B. vaccine. Two or three days later, after arrival at T, a small outbreak of typhoid fever occurred in the detachment. The non-vaccinated and some who had been partly inoculated later than December 20 were attacked. The author claims that the vaccination which had been carried out on the 20th as a prophylactic acted as a curative agent [? a doubtful claim]. Nine men suffered. Of these five were vaccinated during the incubation period. The other four were not protected. The cases are described in detail with temperature charts, and it is evident that the disease was milder in the five protected men than in the other four cases.

J. H. T. W.

HORNUS (Pierre). **Note sur la vaccination antityphoïdique des indigènes marocains.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 248–252.

Anti-typhoid vaccination has been compulsory in the French Army since 1913 ; but in Morocco it has hitherto been confined to European troops. Serious cases made it necessary to protect indigenous troops. Results :—

	Ether vaccine.	*Heated vaccine.*	*Lipo vaccine.*
Total vaccinated	71	71	70
Reaction local only	12	15	27
Reaction general (1st day) ..	25	21	7
,, ,, (2nd day) ..	15	12	8
Excused duty (3rd day) ..	10	8	7
To hospital	1	0	1

[These figures favour the lipo vaccine.]

J. H. T. W.

SHERA (A. G.). **The Present Value of the Widal Reaction in the Inoculated Subject.**—*Brit. Med. Jl.* 1922. Dec. 2. pp. 1076–1077.

Case 1. An ex-soldier inoculated during the war, the last time most likely in 1917. The technique used for the Widal reaction was Dreyer's macroscopic method with Oxford standard cultures. In Case 1 the symptoms were not typical of enteric fever :—

CASE I.

	Serum Dilutions.			
	1 in 25.	1 in 50.	1 in 125.	1 in 250.
Typhoid cultures ..	+	+	+	+
Paratyphoid A	Trace.	–	–	–
Paratyphoid B	–	–	–	–

Strongly positive for typhoid ; but at the autopsy miliary tubercle was found to be the cause of death. It was suggested by Dr. WILLOUGHBY that the positive Widal might have been due to residual effects of wartime inoculation.

	Serum Dilutions.			
	1 in 25.	1 in 50.	1 in 125.	1 in 250.
CASE II.				
Typhoid cultures ..	+	+	+	+
Paratyphoid A	—	—	—	—
Paratyphoid B	—	—	—	-
CASE III.				
Typhoid cultures ..	+	+	+	Trace.
Paratyphoid A	+	Trace.	—	—
Paratyphoid B	—	—		—
CASE IV.				
Typhoid cultures ..	+	+	+	Trace.
Paratyphoid A	—	—	—	—
Paratyphoid B	Trace.	-	—	—
CASE V.				
Typhoid cultures ..	+	+	—	—
Paratyphoid A	—	—	-	—
Paratyphoid B	—	—	-	—
CASE VI.				
Typhoid cultures ..	+	+	—	—
Paratyphoid A	—	-	—	—
Paratyphoid B	—	—	-	—

The examinations in Cases 2 to 6 were made on five healthy ex-soldiers. The positive predominance in typhoid reaction no doubt lies in the greater strength of the typhoid vaccine and possibly also because this was used alone at first during the war.

In Case 1, the agglutination tests were undertaken " without prejudice " to help Dr. WILLOUGHBY in the diagnosis of the disease. Finding strong signs of immunity reaction with no signs of enterica infection the author proceeded to examine Cases 2 to 6 (all healthy men). [It is somewhat strange to find an acquired antibody so strong after many years. It would be of interest to know the exact date of the last inoculation in each of these cases.]

J. H. T. W.

KRAUS (R.). **Sobre a proteinotherapia da febre typhoïde.** [Protein Therapy in Typhoid Fever.]—*Brazil-Medico.* 1922. July 1. Year 36. Vol. 2. No. 26. pp. 1–4.

UNDULANT FEVER.

Bassett-Smith (P. W.). **Mediterranean or Undulant Fever.**—*Brit. Med. Jl.* 1922. Nov. 11. pp. 902–905.

In this lecture Bassett-Smith gives an authoritative survey of the subject. When dealing with the present endemic areas he points out that an educational campaign among the people of Malta has produced very meagre results, and he is of opinion that the destruction of all infected animals is the only prophylactic measure applicable to areas where natives have to be dealt with. At Greenwich he found that quite a large percentage of cows' milk samples gave a positive agglutination reaction with *M. melitensis* and attributes this to infection of the cattle with *B. abortus*. The author's four cases of para-melitensis infection are described; three came from the south of France. One, a debilitated old lady, gave an intense local and general reaction to each dose of vaccine, and an intense purpura followed, with evidence of nephritis. The vaccine proved to be sterile, and when inoculated into guinea-pigs caused no ill effects, so that the reaction seems to have been due to a lowered resistance to the small amount of antigen introduced. A case of melitensis infection is also recorded in which a purpuric rash occurred with each wave of fever. Under diagnosis attention is drawn to the fact that the infecting micro-organism can generally be recovered from joints affected by arthritis, but whether this is recommended as a routine procedure is not definitely stated.

With regard to treatment the ideal is stated to be a combination of an antitoxic serum and an autogenous vaccine, together with the administration of yeast or some similar preparation to increase the phagocytic activity of the blood.

W. Byam.

Marais (David P.). **Undulant (Malta) Fever in South Africa: an Appeal for its Study and for the Recognition of its Chronic Forms.**—*S. African Med. Rec.* 1922. Dec. 9. Vol. 20. No. 23. pp. 459–464.

The chief contention of the author is that the clinical and etiological factors of undulant fever [which he persists in calling Malta fever] in South Africa are insufficiently known. He describes the symptoms of some of the more chronic forms which may be practically apyrexial, but are very persistent and debilitating and are very difficult to diagnose. He recommends that besides the use of vaccines, which should be prepared from South African strains, arsenic should be given, preferably intravenously, the vaccine and intravenous injections alternately in short courses, and he states that "intramine" was used in a small number of cases with encouraging results. Dr. P. du Toit reports from the Veterinary Research Laboratory that the South African strains of *M. melitensis* correspond with those of the Mediterranean and are reliable, and that they are closely related to *B. abortus*, though differing in the effect on guinea-pigs*; the elucidation of this question is receiving special study at the laboratory. All classes of goats and many other animals are susceptible, and though goats' milk is the most common source of infection, urine and possibly meat may spread the disease, but not the dried hides of animals.

P. W. Bassett-Smith.

---

* This differs from the findings of Burnet.

Gow (Archibald). **The Incidence of Undulant Fever in South Africa. Is it a Menace to Urban Communities ?**—*S. African Med. Rec.* 1922. Dec. 23. Vol. 20. No. 24. pp. 475–479.

In this interesting paper the author shows that in South Africa the indigenous Boer goat was free from infection of the *M. melitensis.* From time to time, between 1838 and 1880, shipments of the Angora breed were imported and these brought infection with them. They were interbred with the Boer goats, chiefly for producing mohair, the export of which rose from 870 lb. in 1857 to 23,479,276 lb. in 1912. In 1896 Swiss goats, free from infection, were introduced for their superlative milking properties. A survey by Strachan of the incidence of undulant fever in South Africa showed that endemic centres of the disease were widely spread, and were always due to infected goats. The author shows that in rural districts the incidence of the disease is now more or less stationary, and much legislation is not advisable, but in urban areas the increase of cases requires recognition, for the number of towns returning cases is increasing, for instance Carnarvon, Beaufort West, Graaff-Reinet, and Premier mine. It is stated that there is an increased tendency for families to keep a goat or goats for their own milk supply, and that these are often living under most insanitary conditions and are frequently infected, causing one or more cases in the family. Should, however, the milk be used for sale, wider distribution of the disease would occur. Infection of Swiss goats has been proved to exist and has given rise to cases. Therefore, legislation for urban districts is urgently required, or the Swiss goat industry will suffer. By-laws are required regulating what is meant by milk, viz., that goats' milk must not be mixed with cows' milk. Goats' meat must not be sold as mutton. All goats introduced into towns should be tested and proved to be free from infection and steps should be taken to prevent the introduction of infected goats to herds, more particularly of the Swiss variety. It is also necessary that goats kept for domestic purposes in towns be under certain reasonable regulations with regard to sanitation.

[The infection by meat is not of very great importance as the danger is slight, but the case recently reported in France of infection derived from handling the hides of infected animals should be borne in mind.]

P. W. B-S.

Archibald (R. G.). **An Unusual and Fatal Case of Undulant Fever contracted in Khartoum.**—*Jl. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 26. No. 4. pp. 55–57. With 1 chart.

The author reports a case of malignant undulant fever contracted by an Egyptian soldier, aged 25, at Khartoum, which place he had not left for twelve months. The fever was at first of an irregular character and as the spleen was enlarged he was treated with intramuscular injections of quinine, without benefit. The temperature finally ran high, 105° in the second wave of pyrexia, and he died on the 27th day. The blood tested on the 21st day gave no serum reaction for the typhoid group or for undulant fever, but the *M. melitensis* was isolated from the blood by culture on that day and from the spleen at the post mortem. The organism in young cultures was a minute gram-negative coccus, but in older ones was very pleomorphic. The spleen weighed 23½ oz. and showed a decided increase in the lymphoid elements.

Clinically there were but few symptoms beyond frontal headache and irregular fever until three days before death, when nervous symptoms became apparent. The other interesting points were, the absence of agglutinins on the 21st day with the organism in the blood (bad prognosis), and the early confusion of the case with, and treatment for, malaria.

It is probable that undulant fever is fairly widely distributed in the Sudan. It has been recognized by the Blue Nile at Kassala, Berber, Nuba mountains, Bahr el Ghazal, and by the Red Sea, probably brought by pilgrims from Arabia. Bovine abortion does not occur in the Sudan, and goats are undoubtedly the cause of the infection, but the percentage affected is not known ; luckily the milk is usually boiled by the natives before use. The author emphasizes the importance of proving that the urine is free from the organism, which he terms *Brucella melitensis,* before the case is discharged from hospital.

P. W. B-S.

AURICCHIO (Luigi). **Sull' infezione associata tifo-melitense.** [Associated Enteric and Undulant Fevers.]—*Pediatria.* 1922. Dec. 15. Vol. 30. No. 24. pp. 1155–1163. With 2 charts in text.

A series of cases in or near Naples in which enteric fever (in four due to *B. typhosus,* and in one *B. paratyphosus* B) was associated with undulant fever. Clinically the course resembled that of severe typhoid rather than that of undulant fever. In four cases the *Micrococcus melitensis* was isolated from the blood or urine, the enteric element being diagnosed by the Widal reaction only (apart from the clinical aspect) except in the paratyphosus case when the bacillus was obtained from the blood. A point worthy of special note is the fact that the temperature became normal for a period varying from two to six days, usually after the third injection of typhosus vaccine. [It appears strange that this should have occurred in every case and that melitensis vaccines should have a similar effect in the later stages, and still more strange that the most marked effect of the " typhoid vaccine " was obtained in the paratyphosus B patient.]

H. Harold Scott.

DARGEIN & PLAZY. **Relation d'une épidémie de mélitococcie.**—*Bull. et Mém. Soc. Méd. Hopit. de Paris.* 1922. Oct. 26. 3rd Ser. Year 38. No. 28. pp. 1373–1377.

The authors have previously drawn attention to the presence of undulant fever at Toulon ; they now report a small epidemic at the air station of Aubagne (near Marseilles). This affected 7 out of 14 sub-officers who lived together, and the cases were fairly severe, each lasting from three to five months. Goats' milk or its products could not be incriminated, but the infection was traced to a dog which lived and ate with the sub-officers. This animal, though apparently quite healthy, had shortly before given birth to puppies, two out of three of which were born dead. The blood of the mother had a high agglutination titre for *M. melitensis,* and after the animal was killed the epidemic ceased. [It is not stated how the dog infected the men.] A second interesting point mentioned is that the medical officer and the laboratory assistant who carried out the various technical examinations both contracted the infection, with incubation periods of 17 and 21 days, a further demonstration of the dangerous character of the organism. The third point made was that the usual doses of vaccine (50 to 200 million) were ineffective; better results were obtained with a heated and sensitized vaccine in doses of 500 million to 3,000 million, but the treatment should be commenced as early as possible. [These large doses were apparently given only in one case; they did not produce any definite general or local reaction, but the duration of the disease seemed to be shortened.]

P. W. B-S.

LAKE (G. C.). **Malta Fever in South Western United States, with Special Reference to a Recent Outbreak in Phoenix, Ariz.**—*Public Health Rep.* 1922. Nov. 24. Vol. 37. No. 47. pp. 2895–2899.

Undulant fever has been known to exist in Texas for at least 36 years, and in Arizona for 14. An epidemic of the disease occurred at Phoenix, Ariz., in 1922; there were not less than 32 cases and it was definitely traced to infected goats' milk, 18 per cent. of the herd giving positive agglutination reactions. As goats' milk is sold in a large number of cities in the U.S. and the climatic conditions in the South-west States are favourable, an increase in the incidence of the disease is most likely. It will be advantageous, therefore, from a public health point of view, to prohibit the use of unsterilized goats' milk in the cities.

[It is a pity that our friends in the United States and in South Africa will persist in using the term " Malta Fever " for this disease, which, as they show, is endemic in their own countries.]

P. W. B-S.

REBAGLIATI (Raul). **Apuntes sobre le Fiebre de Malta en Lima. (Epidemiología — Formas clínicas — Diagnóstico — Tratamiento).** [Undulant Fever in Lima.]—*An. Facul. de Med.* Lima. 1922. May–June. Vol. 5. No. 1. pp. 94–104.

Undulant fever is by no means infrequent in the Province of Tumbes, Peru, and differs in several points from the typical descriptions of the condition. In only one instance out of 40 was there a definite history of the use of goats' milk and that was the case of a medical man whose attack began 15 days after eating cheese made from the milk. The infection, in the author's belief, is in most cases transmitted by the agency of flies. The onset is usually insidious, resembling that of enteric fever, though at times it is sudden, with a chill. In one instance there was intense intercostal neuralgia a week prior to any rise of temperature and this persisted throughout the illness. In yet another case a unilateral orchitis ushered in the disease and for a time dominated the scene. This has been noted as a complication but not as an initial symptom. Sweats are not common, whereas nausea and even vomiting are often marked features.

As regards treatment the author puts great reliance on anti-serum and on autogenous vaccines, and the cases recorded here bear testimony to their usefulness. He finds that those patients who do not show a systemic reaction to the serum do not appear to derive any benefit from its administration. Unfortunately, in the cases reported, the doses neither of the serum nor of the vaccines are stated.

H. Harold Scott.

GIRBAL. **Fièvre de Malta guérie par l'autohémothérapie.**—*Jl. des Practiciens.* 1923. Jan. 6. Vol. 37. No. 1. pp. 7–8. With 1 chart.

A case of moderately severe undulant fever was treated with success by autohaemotherapy. From a vein of the arm 5 cc. of blood was drawn, citrated, and then injected subcutaneously; this was repeated three times at intervals of three to four days. The advantages stated are:—(1) the method is always available; (2) its action is always specific; (3) it does not produce any severe reaction. The specific reaction would be obtained whether the infection was due to melitensis or paramelitensis organisms.

P. W. B-S.

ASHE (E. Oliver). **Treatment of Malta Fever.** [Correspondence.]—*Brit. Med. Jl.* 1923. Jan. 6. p. 43.

Arsenical preparations have been found useful by the author in the treatment of undulant fever in South Africa, and he quotes a case of several years' duration which was cured by one injection of galyl. [Arsenical injections undoubtedly act as tonics but have not been generally found to be curative for septicaemic diseases. Undulant fever is a disease of such irregular duration and character that the cases have to be followed up for some time before a cure can be pronounced.]

P. W B-S.

ROZIES (H.). **Fièvre de Malte et abcès de fixation.**—*Progrès Med.* 1922. Dec. 23. No. 52. pp. 671–672.

The author describes a severe case of undulant fever which had failed to improve after treatment by four injections of increasing doses of melitensis vaccine, given at *short* intervals (3 to 4 days), but after a subcutaneous injection of 2 cc. of essence of turpentine rapidly improved when the abscess was evacuated. He emphasizes the importance of the turpentine being old, being given in sufficient dose, 2 cc. not 1 cc., and as early as possible. It should, however, only be used in severe cases, as the one mentioned. In this there was high temperature, persistant vomiting, delirium, and resistance to vaccine treatment. The cure is said to have been effected by the fixation abscess on the 40th day. [There is often a negative phase in this disease and this should be remembered when giving vaccines.]

P. W. B-S.

VINCENT (H.). **La prophylaxie de la fièvre ondulante (Fièvre de Malte ou méditerranéenne).**—*Bull. Acad. Méd.* 1922. June 30. 3rd Ser. Vol. 87. No. 25. pp. 672–678.

The author draws attention to the number and wide distribution of cases of undulant fever reported in France and quotes four cases he has himself seen in Paris, in one of which the patient took five litres of goats' milk a day; the case was complicated with nephritis and endocarditis and ended fatally. It is therefore important to use methods of prevention. He again describes his method, commenced in 1910, of immunizing goats by vaccination, by which he states that the animals become so highly immunized that the injection of large doses of living cultures intravenously or intraperitoneally does not produce any symptoms, and that in contradistinction to the views of ZAMMIT, who believes that once infected the animal never recovers, whether young or old, the organism can never be recovered from their organs on post mortem examination. By this protection of the goats and other animals the incidence in man also must be lowered. He states that besides the use of the protective vaccination it is necessary to educate the owners and keepers of the animals and to appeal to their feelings by showing that the method has financial advantages. It must be also recognized that the urban as well as the rural goats are affected. A strong recommendation from the Academy of Medicine, Paris, was sent to the Ministry of Hygiene to enforce sanitary measures for goats and other animals infected with the *M. melitensis* and to destroy all infected animals.

In the discussion M. BARRIER agreed with Vincent that it was not advisable to make the disease notifiable on the rural code, as it is endemic and not epidemic, but that the Ministries both of Hygiene and Agriculture should push the use of protective vaccination. M. MARTEL thought that the measures would be ineffective unless notification was made compulsory.

P. W. B-S.

BURNET (Et.). **Sur les rapports du** *B. abortus* **(Bang) et du** *Micrococcus melitensis.—C.R. Acad. Sci.* 1922. Oct. 30. Vol. 175. No. 18. pp. 790–793.

The author has already reported on much of his experimental work. carried out at the Pasteur Institute, Tunis, on melitensis infections [see this *Bulletin*, Vol. 19, p. 742.] He now gives in a little more detail his comparative studies of the type cultures of *M. melitensis* and of two of *B. abortus* received from the Lister Institute, London. By morphology and culture characters he was not able to separate these. With guinea-pigs abortus was the more pathogenic, whereas with monkeys it was less so, and he states that with neither organism was there any decrease in healthy guinea-pig births. The strains of one organism differed as much in virulence as did abortus from melitensis. Immunity reactions were unsatisfactory, and with the intradermic test four cases of undulant fever all reacted, but most markedly to abortus. He considers these reactions more analogous to those of human and bovine tuberculosis than to those of human and avian.

Guinea-pigs infected with melitensis and heavily inoculated intraperitoneally with abortus died, and *vice versa*. Though bacteriologically not distinguishable the great difference in the two organisms is seen in the varying pathogenic action on guinea-pigs and monkeys [also man.] It is the most striking example we possess of the adaption of microbes to specific animals.

P. W. B-S.

DENGUE AND PAPPATACI FEVERS.

OLIVIER (P. H.). **Dengue.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.*—1921. Vol. 2. pp. 345–355.

This is a critical and historical survey of the literature on dengue fever, which the author defines as "an acute exanthematic infectious disease of short duration, appearing in all tropical and subtropical countries in endemic as well as epidemic forms, and characterized by peculiar rheumatic pains throughout the whole body, a rather typical temperature chart, moderate leucopenia, a relatively slow pulse, an initial and terminal exanthema, and a very favourable prognosis with often serious subjective and objective phenomena." It has a seasonal character and appears in the hot months of the year. The epidemics mostly begin in coast towns and spread along the main roads of traffic inland. The various forms found in India known as 3, 5 and 7 day fevers are probably the same disease modified by circumstances as yet unknown and should all be classed as dengue-like fevers, but the reasons for differentiating phlebotomus fever are fairly strong. It will only be possible to classify them when the virus of each has been discovered, for they cannot be separated by their clinical symptoms. Cross experiments with insect vectors may help the solution of the problem.

P. W. Bassett-Smith.

SCOTT (L. C.). **Dengue Fever in Louisiana.**—*Jl. Amer. Med. Assoc.* 1923. Feb. 10. Vol. 80. No. 6. pp. 387–393.

A widespread epidemic of a dengue-like fever occurred in Louisiana during the latter part of 1922. The present paper is an abstract of the results of a *questionnaire* sent out to 2,000 medical officers ; there were only 442 replies, and of these 333 were useful. The general conclusions were that the symptoms agreed very closely with those found in standard works for dengue. They did not favour the view that the epidemic was a mild form of yellow fever ; only 6·3 of the observers were in favour of this, though gastro-intestinal symptoms with haematemesis were frequent, jaundice was occasionally found, and, rarely, black vomit (possibly bile). There was little doubt that *Stegomyia fasciata* (which the author, in places, calls *Aëdes aegypti*) were commonly the carriers, and that at the onset of the cold weather the cases decreased with the non-breeding of the mosquito. It is calculated that over 30,000 contracted the disease ; the incidence was largely dependent on the density of the population.

P. W. B-S.

EUGLING (Max). **Ueber das Denguefieber.**—*Wien. Klin. Woch.* 1922. Dec. 21. Vol. 35. No. 51. pp. 991–993. With 1 chart in text.

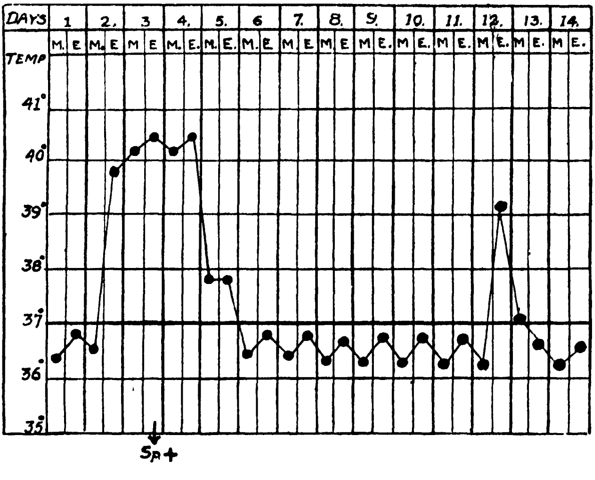
The author reports that in the summer of 1921 a number of Macedonian people came to Vienna and brought with them dengue fever, which at the time was diagnosed and treated as malaria. Such cases were rare there before the Balkan war. In his description of the clinical characters there is nothing new which would be helpful in diagnosis ; this had to be made chiefly from malaria and phlebotomus fever.

P. W B-S.

Couvy (L.). **Note sur deux épidémies de dengue à Beyrouth (1920–1921).**—*Ann. Inst. Pasteur.* 1922. Dec. Vol. 36. No. 12. pp. 851–858. With 4 charts in text.

The author has previously reported finding spirochaetes in the blood of cases of a dengue-like fever during an epidemic at Beyrouth in 1920 [see this *Bulletin*, Vol. 19, p. 66]. There was a similar epidemic in 1921, and he again found the spirochaetes not only before the onset of the fever but during 3 to 48 hours after; they were very scanty. The inoculation of the blood into rabbits gave rise to a fever; spirochaetes were found in the blood of these animals at the time of the onset or relapse; if killed three days after the relapse, no spirochaetes could be demonstrated in the blood, liver, or spleen. The disease can therefore be transmitted from man to rabbits, and three passages were made in these animals without attenuation of the virus. During the epidemic, culex, stegomyia and phlebotomus were abundant, but in Lebanon during an intense epidemic only phlebotomus were found. Experiments to inoculate phlebotomus fed on suitable cases to rabbits gave negative results (two animals each with 10 flies). Injection intraperitoneally of crushed infected flies gave rise to febrile attacks and the spirochaetes were recovered (two animals again used). These facts indicate that the phlebotomus is the "carrier." The point of importance is whether the cases were true dengue or phlebotomus fever? The author, from the clinical symptoms, considers the former to be the right diagnosis, but he gives as a typical chart one of a three-day fever, with a short relapse on the twelfth day, which might very well illustrate phlebotomus fever. He states that a mild relapse often took place about the twelfth week, but immunity for a year was usual.

Temperature Chart of Patient with Three-Day Fever of average severity. [Couvy.]



[Reproduced from the *Annales de l'Institut Pasteur.*]

P. W. B-S.

BRUHAT. **La fièvre à phlébotomes au centre marine de Beyrouth.**—*Arch. Méd. et Pharm. Nav.* 1922. Sept.–Oct. Vol. 112. No. 5. pp. 412–413.

At the marine depot at Beyrouth in 1921 there were 293 cases of phlebotomus fever, giving a total of 1,054 days sickness. The epidemic lasted from May to October, but was most severe in June. The incubation period appeared to be very short, as some of the men were attacked two hours after landing; relapses were very rare. Those on shore suffered most, those in ships moored alongside the quay were occasionally affected, those in ships anchored in the stream, never. The symptoms are said to have been typical, the fever terminating in three days, and being followed by a condition of asthenia for ten days.

P. W. B-S.

KANDELAKI (Simon). **La fièvre pappataci et Phlebotomus en Georgie et dans les pays voisins.**—46 pp. With 3 plates and 6 text figs. [In Georgian. French summary pp. 45–46.] 1920. Tiflis: Imprimerie d'État.

Describes an epidemic of Phlebotomus fever, which is known in the local vernacular as *Hava*, in the coastal valleys of Trebizond, in June–September, 1917, *P. papatasii* being the infective agent. In Georgia also, where *P. perniciosus* and perhaps other species are found, this fever has been observed.

A. A.

WHITTINGHAM (H. E.). **Observations on Sand-Fly Fever in Malta.**—*Proc. Roy. Soc. Med.* (War Section). 1922. Nov. Vol. 16. No. 1. pp. 1–14. With 2 charts in text.

The author from his studies in Malta during 1921 came to the following provisional conclusions: (1) that the type of fever was usually of the three-day variety, in 20 per cent. it recurred on the 9th to the 12th day, and in 12 per cent. again between the 3rd and 6th week; (2) there was an initial slight leucocytosis followed in a few hours by a leucopenia, which lasted three or four days, with again a transient leucocytosis about the 10th day; (3) a leptospira, resembling *L. icterohaemorrhagiae*, was isolated on the first day of the fever by direct culture from the blood of six clinically sand-fly fever cases, but when inoculated into non-immunes failed to reproduce the disease, possibly because an intermediate stage in the phlebotomus fly is necessary. This leptospira was not pathogenic to guinea-pigs. The question is asked, were these really true cases of sand-fly fever? It is just possible that the spirochaete found was a modified form of *L. icterohaemorrhagiae*—modified by passage and perhaps atmospheric conditions. [This is unlikely, as not one of the guinea-pigs inoculated with the isolated leptospira developed jaundice or any symptoms of epidemic jaundice.]

P. W. B-S.

JAPANESE RIVER FEVER.

HATORI (Juro). **Tsutsugamushi-Disease in Formosa.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. p. 187.

The exanthematous fever endemic in Formosa is analogous to tsutsugamushi disease of Japan, clinically and etiologically. It is transmitted by the larva of *Trombicula akamushi* which infests rats, mice, chickens, pheasants and scratching birds in infested fields. In Formosa mite infestation is commonly limited to fields on river banks, foothills of mountains, and thick forest land, irrespective of inundation. Seasonal prevalence is from April to October and the mortality 8 to 10 per cent. The problem is how to exterminate the mites. Protection of labourers from the bites is not easy.

P. W. Bassett-Smith.

NAGAYO (Mataro) & TAMIYA. **Untersuchungen ueber das Japanische Flussfieber (Tsutsugamushi Krankheit).**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 188–195.

The authors give a very full description of what was known in 1921 of tsutsugamushi disease, which can mostly now be found in textbooks.

P. W. B-S.

ROCKY MOUNTAIN SPOTTED FEVER.

NICHOLSON (F. M.). **A Cytological Study of the Nature of** ***Rickettsia*** **in Rocky Mountain Spotted Fever.**—*Jl. Experim. Med.* 1923. Feb. 1. Vol. 37. No. 2. pp. 221–230. With 3 plates.

Some doubts have been expressed as to the nature of the Rickettsia-like bodies described by WOLBACH as causative agents of Rocky Mountain Fever [see this *Bulletin*, Vol. 16, p. 420], and suggestions have been made that they may be mitochondria. The similarity of mitochondria to bacteria led WALLIN to express his belief that they are really bacteria which have developed a high degree of symbiosis. The author has made a careful study of the organism and abnormal cell contents both in the pathological tissues of infected guinea-pigs and in specimens of *Dermacentor venustus* received from NOGUCHI, using efficient controls. The staining for the mitochondria was aniline fuchsin and methyl green, for phagocytosed haemoglobin iron haemotoxylin, and Kye's method for gram-positive bacteria.

" The *Rickettsia* of Rocky Mountain spotted fever were easily differentiated from mitochondria, phagocytosed blood pigment, nuclear debris, and all other known cellular constituents. Although they were lodged within the cytoplasm of endothelial cells, they were not observed to establish any definite relations with the nucleus or with other cellular components. Their number varied in contiguous cells which sustained the same degree of injury as evidenced by nuclear changes, and alterations in their mitochondria content. The mitochondria, on the other hand, showed similar modifications, characterized by a decrease in number and a rounding up into spherules, in all the endothelial cells seen in a section of an affected blood vessel. Diplobacillary forms were most abundant in the early stages of the reaction and single bacillary bodies towards its termination. Other slight differences in morphology from Wolbach's account were noted in the organisms as seen in the tissues of both ticks and guinea-pigs. His study of the distribution of specific lesions with accompanying organisms in the tissues of guinea-pigs was confirmed and extended."

P. W. Bassett-Smith.

UNCLASSED FEVERS OF THE TROPICS.

SCHUEFFNER (W.). **Nicht klassifizierte Fieber im fernen Osten.** [Unclassified Fevers of the Far East.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 334–344. With 7 charts.

The author gives an analysis of various unclassed fevers, including dengue, phlebotomus fever, kedani fever, Weil's disease, simple continued and low fevers. Among the first he includes seven-day fever, the short fever of Java described by van de SCHEER, and six-day fever of Japan, in which a spirochaete has been described. Included under kedani are the tsutsugamushi fever of Japan and Formosa, and pseudo-typhus of Sumatra. His early work on the latter, with its curious local distribution, low mortality, remittent character, slight leucopenia, and the difficulty of infecting monkeys is specially referred to; the vector being the larval form of a Hyalomma [this *Bulletin*, Vol. 5, pp. 360–361].

In Weil's group are included the spirochaetal fevers found in Japan, Europe, and America, and possibly trench fever.

[A great deal of work has been carried out on these diseases since this paper was read, especially by WHITTINGHAM, with regard to the evidences of spirochaetes being the etiological cause of phlebotomus fever.]

P. W. B-S.

CRAGG (F. W.). **Remarks on the Typhus Fever of Kumaon, and on the Suggestion that it is transmitted by a Tick.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 291–292.

Contrary to MCKECHNIE and MEGAW [this *Bulletin*, Vol. 19, p. 67] the author suggests that the peculiar fever found at Bhim Tal and Sat Tal is simply a form of louse-borne typhus. In support of this, he states that probably typhus is endemic in the Kumaon hills, that Bhim Tal is the last halting place on the road from Almora to Kathgodam, that there is a constant to-and-fro movement of the people between the hills and the plains, that louse infection is common among the coolies who work on the roads, and that European travellers, especially women and those carried in dhandies, are very subject to risk of infection by these coolies. The epidemiological evidences of the disease being louse-borne typhus rather than a tick-carried infection are therefore strong.

P. W. B-S.

DE LANGEN (C. D.) & VAN LOON (F. H.). **De overheerschende verschijnselen van het Zenuwstelsel bij de zgn. v.d. Scheer'sche koorts (astheno-neuralgische koorts).** [The Predominating Symptoms of the Nervous System in the so-called van der Scheer's Fever (Astheno-Neuralgic Fever).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 4. pp. 474–489.

Van der SCHEER's fever is one of the dengue-like fevers of tropical countries which is prevalent at Batavia. The authors pass in review the symptoms of the disease (pains, swellings, rash, asthenia, psychic symptoms, etc.) which in their opinion may all be explained by neurogenic influences. They give the best proof of this thesis by showing that the sensibility of the peripheral nerves for galvanic currents is noticeably diminished after an attack of the fever (nerve blocking). They propose the name astheno-neuralgic fever.

W. J. Bais.

BERIBERI.

SULDEY (E. W.). **Une épidémie de béribéri au Gabon. Considérations cliniques, thérapeutiques et prophylactiques.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May-June-July-Aug. Vol. 20. No. 2. pp. 176-185.

This is an amplification of the author's paper on a small epidemic of beriberi in the Gaboon estuary [this *Bulletin*, Vol. 19, p. 758]. He describes more fully the clinical signs and symptoms of the disease, the prophylaxis and treatment. The wet type was found in 73 per cent. of the cases, and many of them were very severe ; he particularly mentions oedema of the neck region, a condition not generally noticed in textbook descriptions. For treatment 100-150 gm. of fresh palm oil given daily was very effective in mild cases, and even in severe ones was most useful when combined with dietetic measures, such as the use of red rice and fresh mealies. He found 1/10 mgm. of digitalin most useful with intestinal antiseptics followed by arsenical preparations, including 0·5-1 gm. of atoxyl injected subcutaneously ! As he believes the disease to be infective he isolates the patients and disinfects the faeces. For prophylaxis good hygiene is essential with fresh food rich in animal or vegetable oxydases.

P. W. Bassett-Smith.

FRAGA (Clementino). **O problema etiologico do beriberi.** [The Etiology of Beriberi.]—*Brazil Medico.* 1922. Dec. 23. Year 36. Vol. 2. No. 51. pp. 395-400.

After a historical retrospect the author gives his own observations on beriberi in Brazil. Diet undoubtedly plays a part, but the condition, in his opinion, is an infective one. He bases this on epidemiological, clinical, and therapeutic grounds. In support of the first he cites the fact that the disease spreads epidemically along the north littoral of Brazil, and mentions an outbreak at the Asylo S. João de Deus, in Bahia, which attacked some of the pavilions and spared others. In regard to the second, the following case is recorded : the patient was attacked suddenly with fever, headache, vomiting and diarrhoea ; on the next day these symptoms persisted and dyspnoea was superadded ; on the third day this last symptom was worse, there was tachycardia and a definite girdle sensation ; on the fourth there was oedema of the legs with paraesthesia and loss of knee-jerks, the temperature became normal, the dyspnoea diminished and the vomiting and diarrhoea ceased ; on the fifth day of the disease " there was definite, complete beriberic polyneuritis." Therapeutically, he states that salvarsan brings about a rapid cure. [For some years past there has been a doubt as to whether these acute attacks, known under the name of " Galloping Beriberi," are true beriberi or a malarial polyneuritis occurring in quartan malaria. It is to be regretted that no blood examination appears to have been carried out in the case of the patient recorded above.]

H. Harold Scott.

SCHNEIDER (Otto). **Postoperative Beriberi. Polyneuritis degenerativa, tropica et subtropica, endemica et epidemica, acute et chronica, latens et recidivans, causa ignota—Beriberi.**—*Ztschr. f. Chirurg.* 1922. Sept. 16. Vol. 49. No. 37. pp. 1357–1361.

After discussing the various theories of the causation of beriberi, the author points out that many conditions which have not been fully studied may come into play (as predisposing causes), such as cold and chloroform narcosis. He quotes three fatal cases after operation, with masked beriberi symptoms, and states that other cases which recovered had a history of latent beriberi. In every case the operation took place during the cold months and chloroform was used, from which he concludes that major operations on patients with signs or history of latent beriberi should not be carried out under chloroform at this time of the year, the resistance of the natives being then at its lowest. If the operation is necessary a local anaesthetic should be used. All cases following operations were of the "vagus type," and are thus particularly susceptible to chloroform narcosis; since the author has taken the above precautions he has not had any further cases of post-operative beriberi.

P. W. B-S.

MAGNENOT (Charles). **Sur une forme curieuse de Béribéri.**—*Jl. des Practiciens.* 1922. Dec. 9. Vol. 36. No. 49. pp. 806–808.

The author describes in detail a very interesting case of beriberi in which the symptoms were at first obscure. When the patient came under observation there was slight fever, gastric symptoms, and increased reflexes; under treatment the gastric symptoms passed off but nerve signs like those of tabes set in, pains, anaesthesia, ataxia, loss of reflexes, and increasing asthenia. A positive Wassermann suggested specific treatment, but no improvement followed, and beriberi was considered probable, and the more so because a number of other Senegalese of the same troop went down with ordinary beriberi. In spite of dietetic treatment, which cured the latter, the patient developed marked anasarca and died.

On investigation of the diet it was found that though of sufficient caloric value, it was of an unvaried character—polished rice, cooked meat, sugar, coffee, salts, and oil; it showed a deficiency of vitamin B.

P. W. B-S.

DEL ROSARIO (S. V.) & LOPEZ RIZAL (L.). **The Prophylaxis and Cure of Infantile Beriberi by Administration of Tiki-tiki Extract.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 211–223. With 2 charts.

Infantile beriberi increased in the Philippines three years after the pandemic of influenza. Children under four months were generally affected, rarely after six months, and only those which were breast-fed; 38 per cent. under one year suffered. The highest incidence was during the months of September–December. The mortality from 1910 to 1915 was 79 to 128 per mille, but since the use of the extract it has fallen to 88 and later 35. The incidence of beriberi developing in mothers treated in the hospital was 15 out of 94. The extract can be used both for prophylaxis and cure, but different brands give very unequal results. It should be administered directly to the baby, which need not be weaned.

The therapeutic value is stated thus: only 4–5 per cent. died, and 60–75 per cent. were cured or improved. The prophylactic value is higher: infantile beriberi was prevented in 81·6 per cent. of children treated.

P. W. B-S.

HIRAI (Seishyu). [**On the Double Refractory Lipoid found in the Urine of Beriberi.**]—*Gun-I-Dan-Zasshi.* (*Jl. Japan Milit. Med. Assoc.*). 1922. Apr. No. 112. [Summarized in *Japan Med. World.* Tokyo. 1922. Sept. 15. Vol. 2. No. 9. p. 268.]

The author states that he was able to demonstrate by means of the polarimeter the presence of double refractive lipoids in the urine of 11 out of 21 cases of severe or moderately severe beriberi, but not in mild or complicated cases. These positive results are analogous to those found in cases of chronic nephritis, and indicate that in the beriberi kidney lipoidal degeneration must be present in some instances.

P. W. B-S.

DE LANGEN (C. D.). **The Significance of the Lipoid-Metabolism in Beriberi. Lipochromes as Vitamines (First Communication).**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 270–323.

The author states that the study of beriberi has been more and more removed from the clinic to the laboratory but requires their complete co-operation. Many years' work has stimulated interest in the biochemical factors in relation to vitamins. It is necessary to bear in mind that with the same diet and conditions different results are obtained with different animals: for instance, maize is sufficient for pigeons and rats, but not for guinea-pigs, goats, and rabbits; dried yellow peas for pigeons and rabbits, but not for guinea-pigs. Deductions, therefore, from animal experiments must be made with caution. We know little of the chemical composition of vitamins though something of their physiological action, and but little of what takes place in the body under the influence of vitamin deficiency. MCCARRISON's work has, however, largely increased our knowledge.

The author took up the study of the chemical composition of the different organs and tissues, but especially that of the blood in cases of human beriberi and polyneuritis in animals. He found that in these conditions (1) the total fat content falls; (2) the lipoids are considerably decreased; (3) the lipocytic coefficient changes; (4) the phosphorus diminishes; (5) the calcium content is low; (6) the blood sugar is high and the other components are about normal. In examining a number of ships he found beriberi in all but one of them, the dietary being the same; in the one that was free, which had about 2,000 on board, the fish supplied instead of being grey was yellow. The colour was caused by the presence of luetine, a lipochrome nearly always present with some lipoids; there was also more cholesterin and phosphatides. The luetine is more or less present in all normal serum but is absent in beriberi, reappearing when the cases are cured.

The lipoids are divided by the author into fat, cholesterin, phosphatides, and cerebrosides. Normally the phosphatides and cholesterin occur together in definite proportions, $\frac{\text{Cholesterin}}{\text{Lecithin}}$, which equals the lipocytic coefficient; on this quotient depend the electrical reaction and the resistance of the red cells. It has great importance with regard to oedema, the water content of tissue being dependent on this coefficient. Its rise in oedema causes a check in the diffusion of ions, and a hindrance in the movement of these is followed by water retention.

If the cholesterin content goes up, as in eclampsia, the phosphatides tend to rise to the same level. The latter break up most readily in the process of metabolism, and in inanition the cholesterin quotient is higher than normal. In this lipoid metabolism the suprarenals play an important rôle, especially in deficiency disease. Nerve degenerations also depend upon the amount of the phosphatides. We do not know whether these latter can be built up in the organs and glands, or are only received in the foods; probably for their formation they require a special ferment, enzyme or catalysator, which is a vitamin. New bones have a great reserve store of phosphatides which during further development diminish, and they are also reduced in conditions of inanition.

He concludes that "the symptoms of beriberi are the consequence of a disturbance of the lipoid metabolism, and this is due to the lack of a substance necessary for the synthesis of the phosphatides, namely, vitamins." In favour of this view he gives a large number of experimental facts: the distribution of lipochromes and vitamins is almost identical; in the milk of cows out at grass the lipochromes are increased with the vitamins; both are found most abundantly in the organs and tissues which are most important for life. The paper contains a record of a large amount of very interesting work, but space does not permit of further report. It should be read *in extenso* by all interested in the subject.

P. W. B-S.

KIHN (Berthold). **Ueber die sogenannte Beriberi der Affen und der Tiere ueberhaupt.**—[The So-called Beriberi of Monkeys and Other Animals.]—*Jl. f. Psychol. u. Neurol.* 1922. Vol. 27. No. 6. pp. 316–324.

This is chiefly a criticism of the view held by WIEDHOLZ that vitamins are hormones of endocrine origin, without which any form of nourishment would be insufficient. The author agrees neither with his premises nor conclusions, but holds that beriberi is due to the deficiency of vitamin in the food itself. The clinical signs and pathological anatomy differ much in man and animals; therefore conclusions should be drawn with the greatest caution. He states that very little has been done in the way of research on the pathological changes in the brain of human beriberi cases, and asks that specimens may be sent to him at the Neurological Institute, Berlin. He also states that the clinical evidences in the cases described by WIEDHOLZ show clearly that the conditions were produced by insufficient supply of the necessary foods and accessory factors.

P. W. B-S.

PALMER (Leroy S.) & HOFFMAN (Clara T.). **Biochemical Properties of the Blood of Pigeons in Polyneuritis and Starvation.**—*Proc. Soc. Experim. Biol. & Med.* 1922. Vol. 20. No. 2. pp. 118–119.

The authors' experiments with pigeons indicate that the decrease in the total solids and in the nitrogenous constituents of the blood, both protein and non-protein, as well as the diminution of erythrocytes, are probably due to the self-imposed starvation which accompanies the later stage of polyneuritis in pigeons. It is to be noted that simple inanition in its advanced stages is accompanied by a decline in the relative amount of protein in the blood which is not apparent even in acute polyneuritis. This result is contrary to the recent observations of PACCHINSA (*Ann. di Clin. Med.*, 1921, 11, 271). The total number of birds used was 51 ; 13 were normal, 8 are described as normal starved, 16 as acute polyneuritis, 7 as latent polyneuritis, and 7 as " relieved " polyneuritis.

P. W. B-S.

VAN DER WALLE. **The Presence of the Antineuritic and Antiscorbutic Vitamins in Urine.**—*Biochem. Jl.* 1922. Vol. 26. No. 6. pp. 713–726. With 5 charts.

The wide distribution of antineuritic substances has been abundantly shown. FUNK proved that purin and pyramidine derivatives act favourably. COOPER was able to cure pigeons with alcoholic extract of faeces. MUCKENFUSS found small quantities in ox bile, human urine and saliva, and GAGLIO also found it in the urine. A further study was therefore carried out by the author. He found that concentrated normal urine had a favourable influence on the polyneuritis of pigeons, that the antineuritic factor was not destroyed by heating at 37° C. for 16 hours, but that a temperature of 130° for one hour destroyed it, and the ash was ineffective. The active principle could be extracted by charcoal, and the urine thus treated was ineffective. Charcoal shaken up with a solution of inorganic salts, containing the cations and anions present in the urine, had only a slight effect. The curative action of the urine was not due to the presence of bacilli, but yeast cultivated in urine, to which 5 per cent. glucose had been added, possessed a strong curative action. The urine of a dog had as strong curative properties as that of man, but when the dog was fed upon a vitamin-free diet the urine lost its curative power. Fresh normal urine and dried urine were both active if given in sufficient quantities. The experiments show that a small quantity of antineuritic vitamin is present in the urine, and that 5 cc. of urine, concentrated, was an effective dose. The author was unable to detect the presence of antiscorbutic vitamin in urine, but as HARDEN & ZILVA have shown that charcoal does not absorb the antiscorbutic factor, this method was not applicable. There are several useful tables and the charts show weights, etc., of the antiscorbutic experiments.

[The only colloids which are known to pass through the healthy kidney are " ferments " (such as diastase), which is a factor of importance when considering the character of these antineuritic vitamins.]

P. W. B-S.

SHIPLEY (P. G.), MCCOLLUM (E. V.) & SIMMONDS (Nina). **Studies on Experimental Rickets. IX. Lesions in the Bones of Rats suffering from Uncomplicated Beriberi.**—*Jl. Biol. Chem.* 1922. Dec. Vol. 49. No. 2. pp. 399–410. With 4 plates & 4 charts.

Very little has been said of the condition of the bones in animals suffering from beriberi. The authors found that rats fed on diet deficient in water-soluble B after 45–50 days developed signs of beriberi ; they all became thin though no definite deformity of the bones was observed. Post mortem the bone changes were exactly the same as seen in guinea-pigs fed upon a scurvy-producing diet—rarefaction, haemorrhages, and destruction of the bone marrow. The haemopoietic marrow may entirely disappear. FINDLAY has shown that the blood of rats with polyneuritis is like that found in human beriberi. Rats fed upon the diet that produces scurvy in guinea-pigs grew normally for at least 105 days, and their bones showed no abnormal signs, demonstrating that with an otherwise good diet rats can dispense with vitamin C. This had been observed by MCCOLLUM and SIMMONDS. Dogs, too, remain well for a long time without vitamin C.

Rats on a diet deficient only in fat soluble A show osteoporotic changes in the bones, but these have no resemblance to those of scorbutic animals.

P. W. B-S.

OKUDA (Midzuho). [**On the Action of Rice Embryo against Avian Polished Rice Disease.**]—*Kenyokwai Zasshi.* (*Jl. of Kenyo Med. Soc.*). 1922. May. No. 158. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2. No. 10. p. 305.]

The extract was made by thoroughly washing the embryo of crushed rice to free it completely from bran, and extracting it with 90 per cent. alcohol for 2–3 hours on a warm bath. The alcohol is then evaporated, and the sediment is infused several times with petroleum ether. This is evaporated completely, and the residue is treated with acetone several times and thus freed from any fatty matter, leaving only the vitamin substance. This embryo extract had a high therapeutic efficiency against polished rice disease.

P. W. B-S.

IRIYE (Eisai). [**On Avian Polished Rice Disease in Special Reference to the Conditions of the Experimental Destruction of the So-Called Beriberic Vitamine.**]—*Nisshin Igaku* (*Progress in Med.*). 1922. June. Vol. 11. No. 10. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 327.]

The author fermented different forms of rice (polished, unpolished, crude, etc.) by means of faecal extracts, and found that when vitamin or "oryzanin" was mixed *in vitro* with fermented juice of *polished* rice and kept at 37° C. for seven hours it completely lost its curative effect, but that it did not when it was mixed with the fermented juice of *crude* rice. From these observations he conjectures that after ingestion of polished rice a similar fermentation destructive of vitamins might occur in the human intestine.

P. W. B-S.

MEDINA JIMÉNEZ (Rafael). **El problema de nuestro beriberi.**—*Gac. Med. de Caracas.* 1922. Oct. 31. Vol. 29. No. 20. pp. 235-238.

This article comprises a general statement of the reasons which have led the author to think that in Zamora at all events beriberi cannot be ascribed to a rice diet, nor to avitaminosis, but to some biological cause, bacterial or protozoal. No fresh evidence is adduced.

H. Harold Scott.

TOYAMA (Chinkichi) (Director of the Tokio Microscopical Laboratory Tokio). **Studies on the Cause of Beriberi.**—1922. 13 pp.

In this short monograph the author gives the results of his ten years study of beriberi. The greater part has already been published and reviewed, and there is nothing new to record.

P. W. B-S.

MONTES (José E.). **Hemocultivos en el Beriberi.**—*La Clinica Castellana.* Valladolid. 1922. Oct. Vol. 25. No. 4. pp. 188–189.

SCURVY.

DONALDSON (S.). **Some Aspects of Scurvy in the Native, and its Treatment by Orange Juice Intravenously.**—*S. African Med. Rec.* 1923. Jan. 13. Vol. 21. No. 1. pp. 7–12. With 5 text figs.

This paper is an amplification of one published in 1921 [see this *Bulletin*, Vol. 19, p. 417] in which the intravenous method of injection of diluted neutralized orange juice was demonstrated in scurvy cases. A further series (number not stated) has been treated with good results and four are described in detail—in one a total of 560 cc. was injected during a period of nine weeks. The author states that recovery sets in with dramatic suddenness, sometimes after five weeks' treatment, supporting the theory that "a considerable reserve of protective vitamin is stored up in one or more of the internal organs and that the onset of recovery is largely dependent upon the depleted reserve being re-established." He found 10 to 15 cc. to be the most efficient dose. Pawpaw juice is less suitable and requires to be given with caution.

P. W. Bassett-Smith.

ARON (Hans). **Alimentäre Anämie und Skorbut.**—*Klin. Woch.* 1922. Oct. 7. Vol. 1. No. 41. pp. 2035–2039. With 3 text figs.

The author states that a new epoch of our knowledge of alimentary anaemia commenced when CZERNY showed that in infants who had been brought up entirely on milk the illness could be cured by reducing the milk and substituting vegetables and meat. KLEINSCHMIDT applied the principle not only to cases of slight anaemia but to those of a more pernicious type with enlargement of the liver. Their view that the harmful factor is found more particularly in the fat of the milk, which had to be reduced, is not held by the author, who found that the essential point in treatment is not the reduction of the milk, *but in the increase of the vegetable vitamins.* As these are in relatively small amounts in the food, the diet should be concentrated so as to keep within limits the bulk of food given to the infant.

This alimentary anaemia is comparable with scurvy and Barlow's disease. He found scurvy symptoms in 7 out of 15 cases of alimentary anaemia, and he believes that we should look upon scorbutic anaemia as of alimentary origin, but whether the same factor is the cause of both is unproven. He points out and illustrates with skiagrams the changes which take place in the long bones both before and after treatment, and shows the characteristic saddle-like depression on the forehead of sucklings suffering from the anaemia. The case shown had a red blood count of 2,000,000, white cells 31,800, and normoblasts 2,340. Differential points noted are that the alimentary anaemia occurs only in unhealthy children and is mostly chronic, whereas infantile scurvy may develop in children who are gaining weight satisfactorily. The dystrophy due to the lack of water-soluble vitamins B, C, and D (FUNK) is common to both, and their supply in the diet is essential for cure, together with a combination of foods giving ample caloric value and fat-soluble factor.

P. W. B-S.

BLACKHAM (R. J.). **Dried Milk in Infantile Scurvy.** [Correspondence.] —*Lancet.* 1922. Oct. 7. p. 780.

Blackham opposes the view of THURSFIELD [this *Bulletin,* Vol. 19, p. 765] that dried milk is a cause of infantile scurvy. He finds that not only are children on this free from scurvy, but it is of special value for infants of the poorer classes who are doing badly. French doctors use it with advantage for atrophic children, and HART, STEENBOCK, and ELLIS have shown experimentally that it is most valuable. He suggests that THURSFIELD's preparations may have been faulty, defective, or aged samples. When pure cows' milk is not available dried milk is the most reliable substitute in the hand feeding of infants.

[The uncertainty with regard to the reliability of the preparations on the market is a deterrent to the use of the dried milks for infants.]

P. W. B-S.

VAN DRIEL (B. M.). **Bier en Scheurbuik.** [Beer and Scurvy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 3. pp. 306–331. With 2 figs.

Contrary to the opinion of A. Henderson SMITH [see this *Bulletin,* Vol. 13, p. 360] who attributes antiscorbutic value to beer brewed on old-fashioned lines, and thinks that the loss of this power in the modern product is due to the use of highly dried, kilned malt, van Driel concludes from his experiments and from historical facts, that (1) the malt in the earlier stages of the brewing process, before any higher temperature has been applied to it, possesses no antiscorbutic power ; (2) that in the history of arctic expeditions in former times the delay in the appearance of scurvy may be readily explained by the more or less large quantities of fresh meat in the dietary. Besides this, hops, and with the hops boiling of the beer, was introduced in the brewing business about 1000 A.D., which fact makes it still more improbable that in the 16th century and later any antiscorbutic power should be attributed to the usual sorts of beer.

Hard work seems to hasten the outbreak of scurvy.

[The quickly fermented beer of South Africa has been shown by DELF and others to have some antiscorbutic power.*—P. W. B-S.]

W. J. Bais.

MOURIQUAND (G.) & MICHEL (P.). i. **Sur la valeur antiscorbutique du jus de citron stérilisé et sur la question des doses d'antiscorbutique nécessaires au métabolisme.**—*C. R. Soc. Biol.* 1922. Dec. 23. Vol. 87. No. 39. pp. 1403–1404.

ii. ——. **Adjuvants non antiscorbutiques de la substance antiscorbutique.** —*Ibid.* pp. 1404–1407.

i. Animals kept upon barley and dried hay, with lemon juice (sterilized at 120° C. for 1½ hours) up to 10 cc., developed scurvy signs after 80 to 100 days, or later. This retardation of symptoms indicates persistence of part of the antiscorbutic substance in the sterilized juice. Animals kept upon 40 gm. of barley alone were tested with 5, 10, 20, and 40 cc. of sterilized lemon juice ; with 5 and 10 cc. scurvy appeared on the 24th day, with 20 cc. between 31st and 36th, with 40 cc. they were well up to 63rd day. Thus there is a relation between dose and time of onset of symptoms which shows that the antiscorbutic substance does not act merely as a catalyser.

---

* "Studies in Experimental Scurvy," Publication No. 14 of the South African Institute for Medical Research, pp. 46–52.

ii. Acute and chronic scurvy can be variously induced by different methods of feeding with foods having no antiscorbutic power. Thus on barley alone guinea-pigs die about the 31st day: if dry hay is added to the diet, equilibrium is preserved longer, but death occurs about the same time, which shows that the hay has in it no anti-scurvy substances. With 40 gm. of barley and 5 to 10 cc. of sterilized lemon juice scurvy appears about the 25th day; but if to this ration of barley and 5 cc. sterilized lemon juice 10 gm. of dried hay be added the onset of scurvy is delayed until the 77th day, and with 20–40 cc. of sterile lemon-juice no sign of scurvy was found in the bones of animals killed on the 66th day.

These experiments show that dried hay, non-antiscorbutic by itself, augments the action of small doses of the antiscorbutic remaining in the heated lemon juice.

When the alimentary equilibrium is profoundly disturbed, as on a diet of pure barley, by the deficiency of such indispensables as amino acids, salts, and lipoids, the deprivation of antiscorbutic substance is rapidly shown; but when these important elements are added to the diet as by addition of hay, the deprivation of antiscorbutic is much less evident; it seems as if the restored alimentary equilibrium favoured the activity of or reduced the demand for the antiscorbutic substance.

P. W. B-S.

HART (E. B.), STEENBOCK (H.) & LEPKOVSKY (S.). **The Antiscorbutic Vitamine. 1. A Study of its Solubility from Desiccated Orange Juice.**—*Jl. Biol. Chem.* 1922. May. Vol. 52. No. 1. pp. 241–250. With 5 charts in text.

In this first part of a series of studies on the antiscorbutic vitamin an attempt has been made to determine its solubility in a number of organic solvents. HESS and UNGER have reported that it is soluble in 80 per cent. alcohol and many have shown that under certain conditions it can be extracted by water. Orange juice was used to supply the vitamin and the experimental animals were guinea-pigs under basic dietetic conditions previously described. The weight curves were charted and four animals were used for each experiment. The vitamin of orange juice desiccated without heat was found to be soluble in 80 to 95 per cent. ethyl alcohol and methyl alcohol and the solution protected the animals from scurvy, but it was insoluble in butyl alcohol, petroleum ether, acetone, ether, chloroform, and ethyl acetate. The results of these tests indicate that the antiscorbutic vitamin is not a fat nor a lipin.

P. W. B-S.

BEZSSONOFF. **Effets sur les cobayes d'une préparation antiscorbutique.**—*C.R. Acad. Sci.* 1922. Nov. 6. Vol. 175. No. 19. pp. 846–848.

An antiscorbutic preparation was made from fresh cabbage juice by evaporating it down to dryness in vacuo at a temperature not higher than 35° C.; 5 parts of the powder were equal to 10 of the juice. It was very hygroscopic and contained neither fats nor proteins. This is called product C. Guinea-pigs were used as the test animals, and were fed on a basic diet plus autoclaved milk, some with addition of cod liver oil, and some with various quantities of product C. It was found that 1/10 gm. of product C was sufficient to maintain normal development of a guinea-pig of 600 gm., and that cod liver oil exerted a harmful action on the guinea-pigs in doses of 7 mgm. per day. This could be partly counterbalanced by strong doses of the anti-scorbutic product.

P. W. B-S.

MOURIQUAND, MICHEL & BERTOYE. **Effets de l'évolution d'une infection par le bacille de Koch sur la marche du scorbut expérimental du cobaye.**—*C.R. Soc. Biol.* 1922. July 15. Vol. 87. No. 26. pp. 537–538.

A series of experiments was carried out to determine whether a tubercular infection hastened the development of experimental scurvy, and whether tubercular animals on a non-scurvy diet showed any evidence of the latter disease; 38 guinea-pigs were used. Scurvy signs were not found in tubercular animals on a normal diet, neither was there any increase in the rapidity of the disease in animals on a deficiency diet. The author states that these conclusions so far only apply to guinea-pigs, and not to the infection in man.

P. W. B-S.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

MONTIER (Francois). **Les formes dissimulées de l'amibiase intestinale.** —*La Médecine.* 1922. Dec. Vol. 4. No. 3. pp. 199–204.

Any form of colitis may be amoebic in origin and it is with the more obscure forms that this paper deals. The patient may even be constipated. Especially misleading are those cases of intestinal amoebiasis in which the main symptoms are located to the right hypochondrium or to the hepatic flexure of the colon in which the diagnosis has to be made from hepatic and biliary disease. Seasonal haemorrhagic colitis is usually not amoebic in origin. The gastralgic form simulates a flatulent dyspepsia; the typho-appendicular form appendicitis; inflammatory amoebic induration of the caecum tuberculosis. Lesions in the rectum or sigmoid may simulate vesical or prostatic affection or even in women left salpingitis. Cachexia due to chronic amoebiasis may arouse suspicions of malignant disease or intestinal tuberculosis.

Associated infections are usually due to malaria and it is difficult to assign the proper rôle of concomitant Lamblia infection or symbiosis with intestinal spirochaetes. Sigmoidoscopic examination may give valuable information and the entamoebae may be demonstrated in scrapings made from the lesions.

Attention is drawn to the frequent association of cancer of the rectum with intestinal amoebiasis. The author has seen two cases and BENSAUDE an equal number.

In resistant cases the author has had good result with the administration *per os* of capsules containing novarsenobenzol (2 containing 0·05 gm. each) or this drug may be given in an enema (dose 0·1 gm. to 0·3 gm. in 60 cc. of water or dissolved in 100 cc. of a mucilaginous decoction).

P. H. Manson-Bahr.

GALMOZZI (Ferruccio). **Sulla dissenteria amebica e sue complicanze.**— [Amoebic Dysentery and its Complications.]—*Giorn. d. Clin. Med.* Bologna. 1922. Aug. 30. Vol. 3. No. 12. pp. 454–462.

Six cases are recorded in detail. Two had ordinary dysentery, one of whom was a native and had never left Italy. A third had an hepatic abscess, and the remaining three hepatitis. Amoebae were found in the stools of five of them. Recovery occurred in all six after injections of emetine. For chronic cases the author recommends, in addition to the emetine (8 cgm. daily), an injection of 30 cgm. of neosalvarsan every five days.

H. Harold Scott.

SELLARDS (Andrew Watson) & LEIVA (Lamberto). **The Effect of Stasis on the Development of Amoebic Dysentery in the Cat.**— *Philippine Jl. Sci.* 1923. Jan. Vol. 22. No. 1. pp. 39–42.

Experiments on the transmission of amoebic dysentery to the lower animals has emphasized three facts: firstly that during the subpassage of virulent strains of *E. histolytica* through a long series of kittens by rectal inoculation a few individuals escape infection, though on reinoculation these animals are found to be just as susceptible as are normal animals; secondly, when the caecum is exposed and the injection material introduced into the lumen of the bowel, infection takes place with surprising regularity; thirdly whether introduced into the caecum or *per rectum* the initial lesions occur in the extreme lower part of the bowel. The question how *E. histolytica* can injure and penetrate the normal mucosa is undecided, but the stasis occurring in the distal end of the bowel certainly affords an opportunity for the organisms to gain a foothold. The subsequent dissemination of the lesions indicates that there are no pronounced differences in the susceptibility of various areas of the large bowel. This point was tested experimentally by placing a broad ligature round the middle of the bowel so as to obstruct the lumen. A suspension of *E. histolytica* was then injected into the caecum and subsequently it was found that amoebic lesions had developed above, but not below the ligature.

Further experiments, in which cats were injected intracaecally and *per rectum* with infective material, brought out strikingly the importance of intestinal stasis as one of the factors determining the location of the initial lesions in experimental amoebic dysentery in the cat. The distribution of amoebic lesions in man demonstrates the tendency for ulcerations to predominate in the caecum, ascending colon, rectum and sigmoid, points at which intestinal stasis is likely to occur.

P. H. M-B.

FIESSINGER (Nöel). **L'épreuve d'emétine dans le diagnostic des petits abcès du foie forme à fruste.**—*Jl. des Praticiens.* 1922. Dec. 16. Vol. 36. No. 50. pp. 825–827.

This purely clinical study emphasizes the difficulties and dangers attending the diagnosis of liver abscess in cases when few, if any, of the characteristic symptoms or signs are present, as is especially the case where the abscesses are small and multiple. The author is enthusiastic about the therapeutic action of emetine and is of opinion that it can be used as a means of diagnosis in cases of doubt.

P. H. M-B.

ESCHBACH (H.). **Hépatite amibienne aiguë à forme de fièvre cachectisante.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Nov. 16. Year 38. 3rd Ser. No. 31. pp. 1487–1491.

In amoebic hepatitis the accompanying pyrexia may dominate the clinical picture and effectually mask the seat of the trouble. In this condition, the right or even, sometimes, the left pulmonary base may be involved. Other cases may show bronchitic symptoms at the apices reminiscent of tuberculosis, but the effect of injections of 0·04 gm. emetine upon the fever and the symptoms is instantaneous and magical, so as to render the diagnosis no longer in doubt. Two cases are quoted in support of this view.

P. H. M-B.

LENOBLE (E.) & JEGAT (Y.). **Dysenterie amibienne avec gangrène limitée de l'angle hépatique du colon propagée au foie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Dec. 7. Year 38. 3rd Ser. No. 34. pp. 1582–1585.

A clinical account of a solitary case. The patient who had suffered much from dysentery had complained of "shoulder pain" for eight years. Radioscopic examination revealed an aneurismal dilation of the ascending arch of the aorta. The Wassermann was strongly positive. Ascites and diarrhoea supervened. At autopsy the anterior portion of the right lobe of the liver and the hepatic flexure of the colon were necrotic. Entamoebae were found in the diarrhoeic stool on one occasion only. The authors are of the opinion that the condition of the liver and gut is to be attributed to these organisms.

P. H. M-B.

SELLARDS (Andrew Watson) & LEIVA (Lamberto). **Investigations concerning the Treatment of Amoebic Dysentery.**—*Philippine Jl. Sci.* 1923. Jan. Vol. 22. No. 1. pp. 1–37.

This paper is divided into three portions: (1) Experiments upon cultural limax amoebae *in vitro*; (2) Experimental treatment of cats infected with *Entamoeba histolytica*; and (3) Clinical observations.

1. Experiments upon cultural amoebae *in vitro*.—The amoeba used was a "limax type" isolated originally from the stool of a healthy person; and the substances tested were emetine, quinine, neosalvarsan, cholalic acid, benzyl benzoate, papaverine, *Castela nicholsoni* Hooker, *Tinospora rumphii* Boerläge and other substances. The substances which exerted a restraining action on growth were emetine (even in a dilution of 1 in 1,000,000), quinine hydrochloride in a dilution of 1 in 100,000, benzyl-benzoate in suspension (1 in 10,000), and *Castela nicholsoni*. The toxicity of the other substances was low. It is not argued that these results can be applied directly to *Entamoeba histolytica* in the living tissues.

2. Experimental treatment of cats.—The spontaneous recovery of control animals was occasionally observed. The authors found that, though kittens are remarkably susceptible to *Entamoeba histolytica*, it is difficult to infect adult cats, and in a long series of experiments many irregularities occur. The incubation period is remarkably short; an animal sacrificed the third day after intrarectal inoculation already showed superficial lesions of the bowel. Early diagnosis is essential in experimental treatment.

Subcutaneous injection of emetine was not well tolerated and showed little or no effect upon the amoebae; so it (and other drugs tested) were given in moderately strong solution by rectal injection, the animals being held head downwards for an hour afterwards to preclude the escape of the injection. Emetine is distinctly toxic for cats; given *per rectum* up to 10 mgm. per kilo. of body weight it caused no loss of appetite, whereas this amount, when injected subcutaneously, produced nausea and vomiting almost constantly. In the treatment of kittens two difficulties are encountered: firstly, being very susceptible to amoebic infection, they require maximal doses of emetine; secondly the rapid development of lesions in the bowel greatly facilitates the secondary invasion by bacteria. Streptococci and other organisms have been isolated by blood culture, and early treatment with emetine does not protect against this bacterial invasion. One animal responded promptly to treatment with emetine up to 35 mgm. per kilo. of body weight, but became very ill 18 days after primary inoculation with amoebae. Death was due to septicaemia; no lesions being found in the bowel at autopsy.

Two adult infected cats were treated with emetine solution, 1 : 1000 *per rectum*, till totals of 22·5 and 20 mgm. per kilo. body weight had been reached. The animals remained well for a long period subsequently and died of other causes, no lesions of the bowel being found at autopsy. If treatment was delayed the therapeutic effect of emetine was found to be by no means as efficacious, and experience indicated that only a small margin exists between the effective and tolerated doses; on the other hand the drug does not appear to exert any prophylactic effect.

Quinine bihydrochloride (200 mgm. per kilo. in 1 : 50 solution) improved the symptoms, though it did not eradicate the infection. It is recommended that in this case treatment should be commenced with strong solutions

The outcome of these investigations is that rectal injections of emetine should be used in man in preference to subcutaneous or intramuscular inoculation. On the other hand the experiments contraindicate the intravenous injection of emetine as producing the maximal toxic effects of the drug. It is useless to trifle with minimal doses of emetine. The comparative pathology of amoebic dysentery in man and cats has a distinct bearing upon the therapeutics of the disease. In young kittens the disease produces an intense diffuse inflammation, but in older cats the process approximates much more closely the conditions found in man.

Until there is experimental evidence to the contrary the authors prefer to adhere to the working basis that recovery from amoebic dysentery in man and in the lower animals results from the combined action of the natural resistance of the host and a moderate action of emetine on the amoebae. The summation of these two factors is necessary for radical cure; a lowering of either allows the disease to progress; minimal doses of emetine do not modify the course of the infection. The effect of feeble natural resistance is illustrated by the fulminating infections seen in kittens.

A comparison of the effective dosage of emetine in man and in experimental animals is given, arranged to show the initial doses required to check the symptoms and the total quantity for eradicating infection.

	In man.	*In cats.*
	mgm.	*mgm.*
Initial dose ..	2– 4	7–10
Total quantity	18–30	20–30

The figure, 18 mgm. per kilo. for the total quantity in man, is based on WENYON & O'CONNOR's recommendation of 1·5 gr. of emetine for twelve consecutive days. The fatal dose of papaverine for cats is stated to be 100 mgm. per kilo. body weight when injected subcutaneously, but this statement was not confirmed. The lethal dose of quinine for cats was not determined.

3. Clinical observations were made on man using three species of plants representing three genera of the Simarubaceae; namely *Harrisonia perforata*, *Brucea amarissima* and *Castela nicholsoni*. The first was not especially toxic for animals and was inefficacious against amoebae; the second proved very toxic for animals, produced nausea in the patients and had little effect upon their amoebae; the third possessed distinct toxic principles, but was well borne by the patients and in five cases it gave prompt relief of symptoms accompanied by the disappearance of amoebae. This work suggests that *Castela nicholsoni* compares favourably with emetine, both in the immediate and final effects of treatment, but that neither it nor emetine, as at present employed, are ideal agents for the eradication of *E. histolytica* infections in man.

P. H. M-B.

RAVAUT (Paul). **Les deux modes d'attaque dans le traitement de l'amibiase.**—*Rev. pratique des maladies des pays chauds.* Paris. 1922. Oct. Vol. 1. No. 1. pp. 8–17.

This paper is an excerpt from the volume by the same author on syphilis, malaria and amoebiasis which has but recently been reviewed in this *Bulletin* (Vol. 19, p. 627). The author believes in the value of a combined emetine-arsenical therapy in the treatment of amoebiasis. The " cure " advocated consists of ten intravenous injections of novarsenobenzol interspersed with doses of emetine. In a period of 40 days the patient receives 3 gm. of novarsenobenzol and 18 injections, totalling 1·08 gm., of emetine.

The alternative is the administration of the author's paste (charcoal, bismuth and ipecacuanha) together with novarsenobenzol, either by the mouth or in the form of an enema. The necessity of prolonged treatment, as in the case of syphilis, is insisted upon.

P. H. M-B.

RENNIE (P. Manson). **Emetine Bismuthous Iodide in the Treatment of Amoebiasis.**—*Lancet.* 1922. Dec. 30. pp. 1374–1376.

This study is based upon 87 cases of amoebiasis under treatment at the hospital for Tropical Diseases, London. The conclusion is reached that emetine bismuth iodide—given as a loose powder in gelatin capsules in 3 gr. doses over an average period of 12 days—has a definite curative effect in amoebic dysentery; though sometimes it may be necessary to give two or three courses.

It is well known that a certain proportion of cases proves refractory, but, on the other hand, emetine injections, although palliative, do not constitute a cure in the same sense.

The treatment must be regulated by the tolerance of the patient; it is not necessary to push the drug to the limit in every case.

The patient must be treated in bed; the diet should be light and easily assimilated, but need not necessarily be restricted to milk.

Delayed vomiting (four hours after ingestion of the drug) does not indicate non-absorption, but rather that the drug is taking effect.

Diarrhoea should be regarded as typical of the action of this drug and, as a rule, three to four dark fluid motions should be passed daily. Restriction in diet for a month after treatment is advisable. Increase in weight is very striking after a successful course of E.B.I.

P. H. M-B.

MARTINDALE (W. H.). **Solubility of Emetine-Bismuth-Iodide.** [Correspondence.]—*Lancet.* 1923. Jan. 20. p. 158.

This note points out, as stated in the Extra Pharmacopoeia (Vol. 1) that, when 0·1 gm. E.B.I. is shaken with 200 cc. 0·2 HCl., an opalescent fluid is formed containing bismuth as oxychloride and emetine in solution. The solubility of the alkaloidal portion in physiological acid at body temperature upsets the theory on which the compound was introduced.

P. H. M-B.

i. Birt (Ed.). **Yatren und Amoebenruhr.**—*Muench. Med. Woch.* 1923. Feb. 16. Vol. 70. No. 7. pp. 205–206.
ii. Menk (W.). **Yatren und Amöbenruhr. (Zu der gleichnamigen Veröffentlichung von Dr. Ed. Birt in Nr. 7 der Münch. med. Wochenschr. Jahrg. 1923.)** *Ibid.* Mar. 9. No. 10. p. 306.

i. The results of yatren treatment in Shanghai are here recorded. It is best given in 10 per cent. solution and injected *per rectum* in quantities of 100 cc. twice daily [see this *Bulletin,* Vol. 19, p. 31.] The clinical records of 28 cases are given, 14 old chronic cases and 14 more recent. In a certain number, for various reasons, treatment had to be abandoned, but sixteen must be regarded as completely cured by yatren. In old-standing cases its injection appeared to cause no inconvenience, but in some acute cases it gave rise to very definite and real pain. Visual control by means of the sigmoidscope would be very desirable, but is impracticable for obvious reasons in an Eastern country.

The author regards yatren as a very efficient adjuvant in the treatment of amoebic dysentery and possibly also sprue, and advocates its wider application. One advantage is that patients can be treated as out-patients.

ii. Menk thinks that yatren acts equally well in fresh and in long-standing infections. Birt's statement that a 10 per cent. solution was employed must be incorrect; if not it explains the occurrence of the tenesmus, etc., noted after the injections. Menk uses initially a 5 per cent. solution in a volume of 200 cc. introduced after careful lavage of the bowels; later larger quantities up to 400 cc. were used, and could be retained for several hours. He considers that Birt's failures are to be ascribed to faulty technique.

Menk thinks that yatren injections should be combined or alternated with emetine therapy.

P. H. M-B.

Kuenen (W. A.). **Yatreen en amoebiasis.** [Yatren and Amoebiasis.] —*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 15. pp. 1711–1713.

Very favourable results of yatren (1 gm. *per os* three times per day for 8–14 days) in four cases of amoebiasis, three of which were of long standing.

W. J. Bais.

i. Cozanet. **Observation d'un cas de mort subite consécutive à une hépatite suppurée.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 231–233.
ii. Goodhart (Gordon W.). **Emetine Bismuthous Iodide in the Treatment of Amoebiasis.** [Correspondence.]—*Lancet.* 1923. Jan. 20. pp. 157–158.

i. Records a sudden death, apparently from sun-stroke; at autopsy an hepatic abscess, the size of an orange, was found.

ii. This note contains the author's personal testimony to the value of E.B.I. in the treatment of refractory cases of amoebiasis. He considers that oil of chenopodium is worth a more extended trial.

P. H. M-B.

BACILLARY DYSENTERY.

MINISTRY OF HEALTH. Reports on Public Health and Medical Subjects. No. 14. Dr. T. W. WADE'S **Report to the Welsh Board of Health on the Occurrence of Bacillary Dysentery in the Ogmore and Garw Urban District in the County of Glamorgan.**—24 pp. With 1 map. 1922. London: H.M. Stationery Office. [Price 1s. net.]

An outbreak of mild bacillary dysentery occurred in the Ogmore Vale, Glamorganshire, in May 1921. The first cases occurred suddenly on May 11, and the maximum number was reached five days later; it is estimated that in all some 1,100 persons suffered from mild dysentery.

Three hundred and twelve cases attended by local practitioners were distributed in 148 houses. The total number of occupants of these houses was 947 and of these 312 were attacked (32·9 per cent.), the greater number being children under five years of age. In the age period of working life (15 years and upwards) the higher incidence upon females may be explained by the greater risks of infection incurred in nursing the sick. On June 1, notifications of similar cases were received from villages at the upper end of the valley, the infection being directly traced to cases at Ogmore Vale. In the period May 11 to August 31, 1921, there were 12 deaths from dysentery; 5 were in infants under 12 months of age; of the remainder 5 were in children 1 to 5 years of age, and two in women aged 59 and 79 years respectively. Bacteriological and serological investigations inculpated the *B. dysentericus* (strain W of the Oxford series) as being the causative organism. Specimens of stools of three patients were taken at an early stage of the disease, and from two, organisms agglutinating with the polyvalent serum of the Lister Institute were obtained. The serums of these three patients agglutinated *B. dysentericus* W up to a dilution of 1 : 800. Out of 23 suspected bloods tested against this organism:—9 agglutinated up to 1 : 800, 1 up to 1 : 400, 3 up to 1 : 200, 3 up to 1 : 100.

The outbreak followed a serious drought, and was limited, in the first instance, to a defined area, coincident in extent with the area supplied with water from the western main. Evidence showed that the houses situated nearest that source of supply were more seriously affected than those more remote. A search was made for the original source of infection without success. Since the war the number of carriers of *B. dysentericus* has probably increased and the original cause of the epidemic, if found, would probably turn out to be either a healthy carrier of the disease or a mild unrecognized case of dysentery. Flies were not very numerous in the affected houses.

P. H. M-B.

CAVAILLON & WIBAUX. **La lutte contre la dysenterie bacillaire; étude d'une épidémie dans le département de l'Aisne en 1921.**—*Rev. d'Hygiene.* 1922. Sept. Vol. 44. No. 9. pp. 800–825. With 5 charts.

During the war the departments of France occupied by the enemy, especially that of the Aisne, suffered severely from outbreaks of bacillary dysentery

A limited outbreak again occurred in April, 1921, in the canton of Rozoy-sur-Serre. Four persons in the same family were simultaneously attacked and three died. The symptoms were those of severe typhoid, but Shiga's bacillus was proved to be the cause. In July, another outbreak occurred, in the canton of Coucy-le-Château, at some distance from the first. Altogether 98 cases occurred, with 11 deaths.

In a similar epidemic in another district of the department 82 cases were notified with 13 deaths (mortality 12·85 per cent.), the comparatively high death rate being attributed to the difficulty in procuring medical assistance in the devastated areas. Smaller epidemics occurred in other villages during the same autumn in scattered foci, the extension of which was checked by the adoption of vigorous measures ; a total of 250 cases with 40 deaths was recorded ; at Villers-les-Guise the death-rate was exceptionally high i.e., 40 per cent. in a limited series of 10 cases.

In this epidemic there appear to have been two waves of incidence, the first culminating about the 10 August, the second two months later.

In its clinical manifestations there was little of note ; in elderly patients signs of the disease were slight, although they eventually succumbed to cachexia ; in children it took the form of an infantile diarrhoea, which, but for the epidemic, would not have been suspected as dysenteric in origin ; nevertheless typical Shiga bacilli were recovered from the motions. The death-rate in children and nurslings was high ; in fact the death roll (16 per cent.) was mainly composed of those at the two extremes of life. The mortality is compared with the Toulon epidemic of 1906 (about 3 per cent.) and the Breton epidemic of 1896 (20–50 per cent.). As regards the etiology, evidence was forthcoming as to great contagiousness. Healthy persons visiting an infected house often contracted the disease and constituted a fresh focus of infection. At the same time telluric conditions were favourable to the spread of the epidemic. The insanitary conditions of the villages on the Aisne, as a result of the war, were undoubtedly responsible ; the main defect being the dearth of " water-closets." In lieu of these latrine trenches had been constructed and it is said that many were situated in unpleasant proximity to the wells from which the water supply was drawn. In some of the localities dysentery hospitals had been situated.

As regards its bacteriology Endo's medium was employed and suspicious colonies were tested immediately, by the microscopic method, with anti-Shiga and anti-Flexner serums. In every case, save one where the Flexner bacillus was obtained, Shiga's bacillus was the responsible organism.

Sero-diagnosis proved disappointing—the reaction appeared later, i.e., after the eighth day and was absent in fulminating cases and in those who died before the fourth day. In a great number of cases it remained negative throughout, even in a dilution of 1 : 30.

Direct microscopic examination of the stool proved of great use in rapid diagnosis. Stress is laid upon the " leucocytorrhoea " and it is said that from specimens containing a high proportion of leucocytes dysentery bacilli were invariably isolated.

It is hardly necessary to detail the sanitary measures improvised : they were mainly concerned with the control of the water supply and the isolation of patients. Special attention was paid to the schools ; sufferers from dysentery were not permitted to return to school for a month, while their mothers and sisters were excluded for three weeks. Strict supervision of water closets and lavatory arrangements was instituted. In the authors' opinion although serotherapy was rather tardily adopted the results obtained were excellent.

Preventive inoculation was practised to a limited extent. The ethero-vaccine of Vincent was employed ; at first it was a polyvalent and latterly pure anti-Shiga. Serum injections were also used as a preventive but with what success was not ascertained.

P. H. M-B.

LICHTENSTEIN (A.). **Over chronische bacillaire dysenterie.** [Chronic Bacillary Dysentery.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 5. pp. 571–588.

Lichtenstein describes his experience in 50 cases of bacillary dysentery (5 Shiga-Kruse, 45 of the atoxic type) at Weltevreden (Java). In several of his cases abdominal complaints had existed before and the author assumes that he was in such cases dealing with relapses of a chronic bacillary dysentery. The infection did not interfere with the general state of health of the patients. As the bacillus usually has been found in one attack only and the interval between the acute attacks is often a remarkably long one the evidence of this thesis does not seem particularly strong. Agglutination is not of much importance for support of the diagnosis ; only 1 : 200 or more is considered conclusive. Serum treatment does not seem necessary as a rule ; most patients did well with a laxative followed by astringents, etc. Administration of an auto-vaccine gave very doubtful results. In wartime the chances of relapse in the many healthy carriers (which the author believes to exist) as well as the increased opportunity of spread of the disease, make vaccination of the troops with Boencke's Dysbacta urgent.

[The reviewer, who saw a serious epidemic of bacillary dysentery (of the atoxic type) in 1918–1919—about 250 cases among a Javanese coolie population of 9,000—met with very few cases in the same population in the following years and among those none had suffered from bacillary dysentery during the epidemic. The number of chronic cases as a result of the epidemic cannot have been of much importance.]

W. J. Bais.

LINS (Abdon Eloy Estellita). **Sobre os agentes da dysenteria bacillar do Rio de Janeiro.** [Bacillary Dysentery in Rio de Janeiro.]—*Arch. Brasileiros de Med.* 1923. Jan. Vol. 13. No. 1. pp. 5–44. With 2 plates.

Dysentery has increased considerably of late in Rio de Janeiro. In 1921 there were 247 deaths recorded, 33 as amoebic, 42 bacillary, and 172 of " unknown cause." In the first nine months of 1922 there were 35 deaths from amoebic, 53 from bacillary, and 248 undetermined. Of 564 examinations carried out on dysenteric stools in the laboratory during the same 21 months there were two in which amoebae were found, 134 in which the usual dysenteric bacilli (Shiga, Flexner, Hiss-Russell, and Strong) were isolated, the remaining 428 being undiagnosed.

The author carried out tests on 50 cases. Bacilli of the Shiga type were isolated in one only, of the Flexner type in two, " pseudo-dysenteric bacilli of the Morgan type " in two, *B. coli* alone in 31, while in the remaining 14 he obtained an organism which resembled *B. coli* in certain particulars, but was sufficiently distinct serologically to merit special mention. This is designated *Escherichia braziliensis* and has the following characters : It is motile and possesses six to ten perithichial flagella ; it causes turbidity and a thick deposit in nutrient broth; clots milk; ferments lactose, glucose, saccharose, and sometimes mannitol and maltose; is pathogenic to guinea-pigs and rabbits, setting up diarrhoea and oedema of the colon; is not agglutinated by any of the common coli-typhoid group of sera, but an homologous serum agglutinates in dilutions of 1 : 3,000, and even in some cases 1 : 7,000.

H. Harold Scott.

PATTERSON (S. W.) & WILLIAMS (F. E.). **Observations on Dysentery Bacilli of the Sonne Type.**—*Med. Jl. Australia.* 1922. Nov. 25. 9th Year. Vol. 2. No. 22. pp. 608–610. With 3 text figs.

During the summer 1920–21 the authors isolated a type of dysentery bacillus which proved, on further investigation, to conform to the bacillus isolated by SONNE (Type III., THJØTTA). On MacConkey plates the bacillus appears as small, rounded, translucent colonies closely resembling those of *B. dysenteriae* (Flexner), but after further incubation they became more opaque, larger, with irregular outline. In lactose broth, with ANDRADE's indicator, formation of acid is shown about the ninth to twelfth day of incubation. The bacilli are agglutinated by Flexner-Y serum in low dilution and are pathogenic to rabbits, causing death within 36 hours. These animals can be immunized against this bacillus, the serum produced being remarkably specific. The organism is also pathogenic to guinea-pigs.

The original patient from whom the Sonne bacillus was obtained suffered from carcinoma of the pylorus; the second had had numerous relapses of amoebic dysentery during the war; the third suffered from attacks of acute colitis. It was also obtained from three babies with ileocolitis.

The serum of the third case did not agglutinate the bacillus five months after the onset of the disease and four months after recovery.

Agglutination tests were carried out with the serums of 128 patients, 37 of which gave an agglutination titre above 1 : 80, and of these 13 had a history of diarrhoea. Of 91 patients whose serum agglutinated the bacillus in a dilution below 1 : 80, six only had muco-pus in the stools. Eight typhoid sera agglutinated at less than 1 : 50.

They are of the opinion that diagnosis at the present moment can only be made by actual isolation of the bacillus

P. H. M-B.

STUTZER (M. J.). **Eine neue Art des Paradysenteriestäbchens.**—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Feb. 15. Vol. 90. No. 1. pp. 12–17. With 1 text fig.

Apparently the bacillus in question, *B. paradysenteriae* X, is identical with that described by SCHMITZ. It was isolated from an outbreak in East Prussia early in 1917.

P. H. M-B.

GARDNER (A. D.). **Standard Agglutinable Cultures of the Dysentery (Flexner Group) Bacilli.** [Correspondence.]—*Lancet.* 1922. Dec. 30. p. 1405.

When the first standard agglutinable cultures were issued in 1916 from Oxford for the Medical Research Council, only one type was made (*B. dysenteriae,* Flexner—now known as V): for this particular culture the limits of normal agglutination were 10 standard units for males and 20 for females. At a later date the number of Flexner-type standard agglutinable cultures was increased to five (V, W, X, Y, Z).

In the early part of 1922 tests with sera of 120 healthy persons were performed, and it was found that with two of the type cultures a certain proportion of normal, particularly female, sera showed agglutinins in excess of the units laid down, so that readjustment was necessary in the case of W and Y.

All subsequent suspensions of the types have been standardized upon this improved basis.

P. H. M-B.

ACTON (Hugh W.), CHOPRA (R. N.) & BOYD (T. C.). **The Reduction of Amino-Acids into Simpler Natural Bases (Amines) by the** *B. dysentericae* **(Shiga).**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 837–846. With 5 figs.

An acute attack of bacillary dysentery (Shiga) occurring during pregnancy causes miscarriage. Experiments undertaken to isolate the substances causing contraction of the uterus, showed that Shiga's bacillus, in a culture rich in amino-acids (in this case veal broth), forms a substance which contracts the isolated uterus of a guinea-pig; Flexner bacilli produce no such substance. The body produced by Shiga's bacillus is thermostable, dialysable, not neutralized by polyvalent anti-dysenteric serum, but is precipitated by phosphotungstic acid. It is active in acid, but inert in alkaline solutions, soluble in water, but not in chloroform or benzene.

It probably belongs to the class of non-volatile amines. The variations in the amount of amine produced by Shiga's bacillus when acting on different media suggests that the same differences may occur in the human body and so account for the symptoms of collapse and fall of blood pressure in some instances.

P. H. M-B.

DUMAS (G.) & COMBIESCO (D.). **L'intoxication dysentérique du lapin et l'intoxication cholérique du cobaye par ingestion de toxines dysentérique et cholérique solubles.**—*C.R. Acad. Sci.* 1922. Oct. 16. Vol. 175. No. 16. pp. 652–654.

The intravenous injection to rabbits of 1 to 2 cc. of culture of Shiga's bacillus in saline or in broth causes paralysis of the extremities generally without supervention of intestinal symptoms. At autopsy oedema of the caecum is present without any ulceration of the mucosa. It is difficult or almost impossible to reproduce the lesions and characteristics symptoms of bacillary dysentery as usually observed in the disease in man. The authors attempted to do so by the administration *per os* of dense emulsions of Shiga's bacillus together with sulphate of soda, podophyllin or croton oil.

On the other hand it is easy to reproduce dysenteric intoxication in the rabbit by making the animal absorb the filtrate of a bouillon culture of Shiga's bacillus kept at 37° C. for eight days. The liquid should be introduced by means of a 10 cc. pipette, care being taken not to injure the mucosa in any way. Thirty-four hours afterwards the animal becomes feeble with paresis of the extremities. The caecum at autopsy is found to be thickened and oedematous. The mucous membrane is not scarred or ulcerated, though submucous haemorrhages are visible.

Following the technique of METCHNIKOFF, ROUX and SALIMBENI, they also attempted to reproduce in guinea-pigs choleraic intoxication. The filtrate of a 2 per cent. peptone culture of the vibrio, kept for four days at 37° C. and filtered through Chamberland bougie L3, when injected subcutaneously in 0·25 cc. doses into guinea-pigs causes death in 24 hours.

P. H. M-B.

FUKUHARA (Y.). **Beitrag zur Wertbestimmung des anti-toxischen Dysenterieserums.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1923. Vol. 35. No. 5/6. pp. 482–487.

For testing dysentery toxins and for the evaluation of dysentery serums mice are the most suitable animals; their susceptibility to dysentery toxin, in proportion to body-weight, is one hundred times less than the rabbit's.

By utilizing the author's standard serum one can also test the dysentery serum for the number of anti-toxin units it contains. According to Japanese experience 20 anti-toxin units concentrated in 1 cc. anti-dysenteric serum should be regarded as the minimum standard amount.

P. H. M-B.

DOPTER (Ch.), DUMAS (J.) & COMBIESCO. **Sur la nature de la toxine dysentérique.**—*C.R. Soc. Biol.* 1922. Dec. 2. Vol. 87. No. 36. pp. 1140–1141.

OLITSKY and KLIGLER claimed that Shiga's bacillus produces two toxins—an endotoxin and an exotoxin [see this *Bulletin*, Vol. 16, p. 18]. It was asserted by them that when grown in a bouillon-egg medium with free access of air there is given off (*a*) an endotoxin which is thermolabile and is destroyed at 75° C., and (*b*) an exotoxin which appears only after long incubation (*i.e.*, 25 days); it is thermostable. In repeating these experiments the authors used the same mediums and incubated for five days; the filtrate produced in rabbits nerve paralysis without intestinal symptoms, but when they died oedema of the intestinal mucosa was found to be present. Other rabbits were injected, either with liquid dysentery toxins (according to KOLLE's method) or with dead or living organisms, and identically the same clinical and pathological state was produced in these animals. In face of the ascertained facts it seems difficult, they think, to postulate the existence of two distinct dysenteric toxins.

P. H. M-B.

BROWN (H. C.). **The Use of Rhubarb in Acute Bacillary Dysentery.**—*Lancet.* 1923. Feb. 24. p. 382.

This research was instigated by the communication of BURKITT [see this *Bulletin*, Vol. 19, p. 41]. A watery solution of the purgative constituents of rhubarb was used in the strength of 1 gm. rhubarb extract to 3 cc.; ·5 cc. of the solution was implanted with 0·2 cc. of a filtered 24-hour broth culture of dysentery bacilli. After permitting the solution to act upon the organisms at room temperature up to two hours, a platinum loopful was planted into 10 cc. nutrient broth. No inhibition of growth occurred.

On the surmise that the therapeutic action of rhubarb might be dependent on its cholagogic properties, 10 per cent. solution of taurocholate of soda or sterile ox-bile was used without in any way altering the result.

It therefore appears that neither extract of rhubarb nor undiluted ox-bile has any distinct germicidal action upon dysentery bacilli under the conditions employed.

P. H. M-B.

DERNBY (K. G.) & NÄSLUND (Carl). **Die Beziehung der Wachstumskurven einiger Mikro-organismen der Dysenterie-Coli-Gruppe zur Wasserstoffionenkonzentration.** [Relation of the Growth Curves of Organisms of the Dysentery-Coli Group to the H-ion Concentration.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1923. Vol. 35. No. 5/6. pp. 450–454.

A number of organisms of the typhoid, coli and dysentery groups were studied for the optimum conditions of growth. In reaction the optimum appears to be in the region of neutrality; media should therefore have an initial water-concentration of P_H 7 to P_H 7·5. Should the medium not contain sugar the reaction should be 7; if it does, it should be higher, P_H 7·5–8·0.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1921.** [FLETCHER (William), Acting Director.]—13 pp. [Dysentery. pp. 6–9.]

One thousand and fifty-three cases from the dysentery wards of the District Hospital were examined; of these 240 died, a mortality of 22·79 per cent. Bacillary dysentery proved more common than amoebic. Dysentery bacilli were isolated in 473 cases (44·9 per cent.) while *E. histolytica* was found in 167 (15·86 per cent.); Shiga's bacillus was only found in 27 cases, whereas 446 were due to the Flexner organisms. The case mortality-rate in this series was 27·68 per cent.

Anti-dysenteric serum preserved in cold storage and sent out monthly from the Lister Institute was administered in doses of 40–160 cc. to 212 patients; of these 27·7 per cent. died, whereas in the control series of 261 cases without serum the mortality was 27·6 per cent. The apparent lack of response to serum treatment is ascribed to the enfeebled condition of many of the patients; it is otherwise in the case of people of a more vigorous constitution. The cachectic condition of many of the Tamil coolies is ascribed to the prevailing economic conditions and the slump in rubber and tea.

The dysentery bacilli isolated from these cases could be classified as belonging to one or other of ANDREWES' five races.

Malaria being the almost universal complication of dysentery amongst vagrant coolies, every dysentery patient was given 20 gr. quinine daily.

Prevention of bacillary dysentery is best obtained by sanitary measures and by early treatment, since prophylactic inoculation, especially against Flexner dysentery, is of doubtful value.

In an epidemic killed cultures of Shiga bacilli were administered by the mouth, as recommended by BESREDKA. Of 31 contacts who received it 4 contracted the disease subsequently, but none died. In the unprotected there were 69 cases, with 17 deaths.

Epidemics are probably spread by personal contacts or indirectly by food, fingers and flies.

One hundred and sixty-seven patients suffered from acute amoebic dysentery; of these 18 per cent. died. In most death was not due to dysentery, but to some other disease. The experience of the earlier months of 1921 seemed to indicate that emetine was not active in amoebic dysentery, but in July the preparations of emetine were made up in the laboratory and the results subsequently were uniformly good. At the post-mortem examinations made on patients in this group, who had died from other diseases while undergoing a course of emetine injections, the healing of amoebic ulcers was found to be taking place " with almost magical rapidity."

A number of experiments were made with the object of ascertaining the persistence of dysentery bacilli in the faeces. Samples of excreta from acute dysentery were divided into two portions, one of which had been mixed with Teague and Clurman's solution; these samples were kept at laboratory temperature (80° F.) and plated out daily. Shiga bacilli were isolated as late as the 16th day from a specimen of the mixture, and not later than the 4th from an unmixed sample. Specimens were sent from a village at some considerable distance from the laboratory and Shiga's bacillus isolated when the specimens were six, seven and eight days old.

P. H. M-B.

LITTLE (E. Marjory). **Dysentery: Bacillary and Amoebic.**—*Med. Jl. Australia.* 1923. Jan. 6. 10th Year. Vol. 1. No. 1. pp. 1–5. With 4 text figs.

The faeces of all cases of gastro-enteritis in the Royal Alexandra Hospital for Children, Sydney, were examined for evidences of dysentery. They could be divided into two groups.

Group I. Cases beginning suddenly with frequent motions, mucus and blood, and other characteristic features. From 29 of these cases the Flexner bacillus was recovered, and from 5 Shiga's bacillus.

Group II. Infants whose health had never been good and in whom diarrhoea had been more or less persistent. No dysentery-like organisms were ever recovered from the stools.

P. H. M-B.

BEYNEN (G. J. W. Koolemans). **Chronische diarrhoeën bij uit Indië gerepatrieerden.**—*Tijdschr. v. Vergelijk. Geneesk., enz.* Leiden. 1922. Nov. 25. Vol. 8. Nos. 2/3. pp. 102–118. [English summary pp. 118–119.]

The chief bowel diseases in patients invalided home from the East Indies are amoebic dysentery and sprue; bacillary dysentery is, owing to its more acute nature, less often seen. The diagnosis of the first disease is of course very easy if all stools are microscopically examined, for it is then found that very slight diarrhoea may be caused by the *Entamoeba histolytica.* The treatment of these cases, being resistant to emetine, is difficult, but the Yatren treatment of MÜHLENS has been found to be most efficient. The diagnosis of tropical sprue is a much more difficult matter, especially at the onset of the disease; the most valuable symptom for diagnosis is the appearance of large quantities of fatty acid crystals in the faeces.

P. H. M-B.

WHITTINGHAM (H. E.). **Observations on the Pathogenicity and Treatment of Flagellate Dysentery.**—*Jl. State Med.* 1923. Mar. Vol. 31. No. 3. pp. 126–135.

The symptoms emphasized in the condition known as flagellosis are recurrent attacks of diarrhoea, passage of mucus and perhaps blood, thickening and tenderness of certain areas of the bowel, a slight leucocytosis, and neurasthenia ; moreover, in Lamblia infections the stools were often distinctive—pultaceous, pale, and of a characteristic odour. No one can say that recurrent diarrhoea is a normal condition in man, nor are such flagellates as *Lamblia intestinalis*, *Trichomonas hominis* and *Chilomastix mesnili* normal inhabitants of the bowel. The suspicion of their pathogencity is strengthened by the frequent passage of mucus containing them in large numbers. Many cases of pure flagellosis show a relative and absolute increase of large lymphocytes in the blood, and most cases eosinophilia (5 to 8 per cent.), which disappeared with the flagellates. The occurrence of jaundice in one case of pure Trichomonas infection points to a higher *habitat* in the intestine than is commonly suspected. Independently of macroscopic lesions, chronic irritation of the mucosa is liable to lead to neurasthenia.

As regards treatment, bicarbonate of soda is given three times daily in 15-gr. doses for three days, the idea being to remove mucus coating the gut. Then, further to clear the road for the action of specific drugs, a 3-gr. dose of calomel, followed next morning by two drachms of magnesium sulphate. Afterwards thymol, in three 30-gr. doses in cachets, followed by an emetine-bismuthous-iodide course of 33 gr. and high lavage of the colon on alternate mornings with sulphate of quinine solution (10 to 20 gr. to the pint). After the course the faeces were examined for at least three weeks, the patient being discharged from hospital on a tonic pill.

Adopting this routine, at least 50 per cent. of Lamblia infections have been cleared up and all the Trichomonas cases except one have recovered.

P. H. M-B.

MARCUCCI DELGADO (A.). **El Método Escomel en la tricomonosis infantil.** [The Escomel Treatment of Trichomonas Infection in Children.]—*Gac. Méd. de Caracas.* 1922. Mar. 15. Vol. 29. No. 5. pp. 65–66.

This treatment consists in the administration of essence of turpentine to children harbouring the *Trichomonas hominis*. Two cases are recorded. The first, a child of six years, suffered from diarrhoea (10–12 copious, yellowish, liquid motions daily), with oedema of the face, scrotum and legs. There was no pain, fever, or tenesmus. Examinations of the faeces revealed Trichomonas in large numbers, together with ova of Ascaris and cysts of *Entamoeba coli*. After ten days' treatment the first-named could not be found, though the others remained. The oedema disappeared. In the second case, a boy of five years, no material improvement resulted. The drug is better tolerated by children than by adults, in whom it produces nausea, headache, deafness, and pains in the ears.

The author states dogmatically that *Trichomonas hominis* "is a proved causal agent of diarrhoea and dysentery."

H. Harold Scott.

FORRAI (Elemér). **Balantidien-Colitis.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Dec. 21. Vol. 89. No. 6. pp. 186–191. With 3 text figs.

In November, 1921, a case considered upon clinical grounds to be one of enteric fever plus acute nephritis came to autopsy at Budapest, when acute endocarditis, sepsis, parenchymatous degeneration of the kidneys and ulcerative colitis due to *Balantidium coli* were found.

The subject, a peasant woman, had been ill for two weeks, commencing with a rigor ; there was no history of previous dysentery or diarrhoea. The clinical picture and the temperature chart suggested a septic fever with considerable mental derangement. The ulceration was most abundant in the caecum ; the sigmoid flexure was normal.

The parasites were easily demonstrated in haematoxylin-stained sections in necrotic foci in the submucosa, which had also in places undergone hyaline degeneration ; in the mucosa they were rare in the vicinity of the muscularis mucosae, which they were seen to penetrate. The parasites had one or two vacuoles and often contained ingested red blood corpuscles, and sometimes they occurred in long chains.

The author thinks that, in this instance, the Balantidia were pathogenic and the cause of the ulceration. He states also that so far there have been described about 200 human cases of balantidial colitis.

P. H. M-B.

TANAKA (Toshiwo). **[Preliminary Reports on the Reason of the Development of Cerebral Symptoms in Severe Infantile Dysentery and Ekiri.]** —*Iji Shimbun* (*Med. News*). 1922. Sept. No. 1102. [Summarized in *Japan Med. World*. Tokyo. 1922. Dec. 15. Vol. 2. No. 12. p. 348.]

Symptoms of encephalitis develop in severe forms of infantile dysentery. Should the encephalitis be severe, it generally follows that the bowel symptoms are also.

P. H. M-B.

BRUCHANSKY (B.). **Zur Aetiologie der Kinderruhr.**—*Rev. Microbiol. & Epidemiol.* Saratov 1922 Vol. 1. No. 3. pp. 293–294.

MCKINLEY (Earl B.). **Notes on d'Herelle's Phenomenon. Adaptation of Bacteriophage Antagonistic to** *Bacillus Dysenteriae* **and other Bacilli to Various Cocci. Development of a Polyvalent Bacteriolysant. (Preliminary Report).** —*Jl. Lab. & Clin. Med.* 1923. Feb. Vol. 8. No. 5. pp. 311–317.

NICOLLE (Charles) & CONSEIL (E.). **Vaccinations préventives par voie digestive chez l'homme dans la dysenterie bacillaire et la fièvre méditerranéenne.**— —*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Vol. 3. No. 1. pp. 67–70. [Already summarized from *Annales de l'Institut Pasteur.* See this *Bulletin.* Vol. 20. p. 115.]

ORTICONI (A.) & GAZZOLA (M.). **Entérite dysentériforme par** *Amoeba coli.*—*Presse Méd.* 1922. Dec. 6. Vol. 30. No. 97. pp. 1052–1053.

SPRUE.

POWELL (Arthur). **House Incidence of Sprue suggesting its Infective Nature.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. June 22. Vol. 16. No. 3. pp. 125–130. (Discussion pp. 130–134.)

The peculiar geographical distribution of sprue is suggestive, and its infectious possibility is strengthened by the occurrence of cases in closely associated individuals.

In the Bombay City Police the disease appears to have been prevalent, but only among the higher ranks (six cases) ; not among non-commissioned officers and the native staff, at any rate in the period under review.

Other groups of cases are cited : In group B were 4 cases in the same house ; in group C, 16 cases occurring in various bedrooms of a residential club ; in group D, 2 cases, partners in the same firm ; in group E, 3 cases in men occupying the same office ; in groups F and G, partners in the same firm ; in group H, 3, and in group J, 2 brothers.

In the discussion which followed, other similar instances were adduced, and it was thought improbable that sprue is, in the true sense, infectious, but that these closely associated individuals had all been exposed to the same environment.

P. H. M-B.

ROGERS (J. M.). **Isolation of *Monilia psilosis* in Tropical Sprue (Psilosis). Report of Case that originated in Korea.**—*Jl. Amer. Med. Assoc.* 1922. Nov. 11. Vol. 79. No. 20. pp. 1677–1678.

The patient from whom the yeast culture was isolated contracted the disease in Korea in October 1917 ; in February 1922 an organism giving the reactions of *Monilia psilosis* and identified as such by ASHFORD was isolated from the faeces. A vaccine made from this organism, and injected into the patient, caused a marked local and systemic reaction, while a control in a normal person produced no effects whatsoever.

A similar organism was obtained from the stools of the writer, which he attributes to living for four years in the endemic area in a house in which five cases of sprue had developed within the last six years. The stools of 14 patients suffering from chronic diarrhoea in North Carolina were systematically examined for *M. psilosis* without success.

P. H. M-B.

ELDERS (C.). **Over den vorm, het beloop en de prognose van de anaemie bij Indische spruw en over de aetiologie der pernicieuse anaemie.** [The Type, Course, and Prognosis of the Anaemia in Sprue and on the Aetiology of Pernicious Anaemia.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 21. pp. 2267–2276.

Elders, whose views about sprue being a deficiency disease have been referred to before [this *Bulletin*, Vol. 14, p. 121 and Vol. 17, p. 184], points out that the blood picture in sprue shows remarkable resemblance to that of pernicious anaemia (anisocytosis, normoblasts and megaloblasts, increased haemoglobin index). On the other hand cases of pernicious anaemia may show symptoms suggestive of sprue (typical tongue, diarrhoea).

Autointoxication as an exclusive aetiologic factor of this disease is not sufficient to explain some features of pernicious anaemia (its frequent appearance during pregnancy or lactation, the large and increasing quantities of toxic substances required to produce it experimentally). A certain " weakness of constitution " must be assumed to exist besides the intoxication, if the latter exists at all. Elders considers this weak constitution to be a deficiency of the diet, especially in amino-acids, as he has suggested for sprue. He proposes the same dietary treatment, in which fresh meat forms an important part.

W. J. Bais.

SOLANO RAMOS (F.). **Otra teoría mas sobre la etiologia y patogenia del sprue.**—*Asclepios.* Habana. 1921. Sept.–Dec. Vol. 10. Nos. 9–12. pp. 175–183.

MEDICAL ZOOLOGY.

GIGLIOLI (G.). *Armillifer Brumpti* **n. sp., nouvelle espèce de Linguatulidé de Madagascar.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 565–572. With 2 text figs.

A full description, with figures, of the male and not quite mature female of this new species, the adults being parasites of an unidentified snake, and the larval forms in the liver and lung of a tanrec. It is the first species of Linguatulid recorded from Madagascar.

A. A.

NOC & NOGUE. **Note sur un cas de porocéphalose.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. Dec. Vol. 1. No. 5. pp. 6–9.

Case of a sepoy from the Ivory Coast. Twelve days after admission (for ulcerating syphilides) he became fevered, the fever being of an enteric type, and the abdomen tender to palpation. At one time there was difficulty in swallowing. After the fever abated he remained in a wasted condition, stupid, with an uncertain gait like a drunken man, so that an examination was made for trypanosomes. About seven months after admission he died in a cachetic state and wasted to a skeleton, having passed the last three months of his life like a beast.

At the autopsy from 150 to 200 encysted larvae of Porocephalus were found—distributed in the parietal and visceral peritoneum, liver, and upper lobe of the right lung, but not elsewhere.

Subsequent inquiries elicited the information that the natives of certain villages of the Ivory Coast are accustomed to eat pythons' flesh.

NOC & NOGUE. **Un nouveau cas de porocéphalose humaine.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Dec. Vol. 2. No. 10. pp. 284–286.

The patient, a sepoy from the southern Sudan, died after being in hospital for three weeks with symptoms of a chronic nephritis of undetermined aetiology. At the autopsy the peritoneal cavity was full of ascitic fluid, and both kidneys were enlarged and in an advanced stage of fibrosis; 20 larvae of Porocephalus were encysted in the liver, 15 in the peritoneum, and 2 in each lung; but none was found in any of the other organs; the duodenum contained 15 ankylostomes (*Necator americanus*). Subsequent inquiry brought out the interesting information that the patients' fellow-countrymen feed on the flesh of the python, and often eat the reptile's fat as a charm.

Although larvae were not found in the kidneys, the authors are inclined to think that there is a relation of cause and effect between the porocephaliasis and the chronic nephritis. For one thing, they actually observed, on another occasion, an encysted larva, which had been removed from a cyst, travel through a piece of kidney-tissue in the course of 24 hours, without making a lodgement.

A. A.

Noc (F.). **Infestation massive naturelle de la Genette du Sénégal par des larves de Porocéphales.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 621–631. With 3 plates.

The subject of this massive infection was a genet or civet, *Genetta pardina*, very common in the neighbourhood of Dakar. The

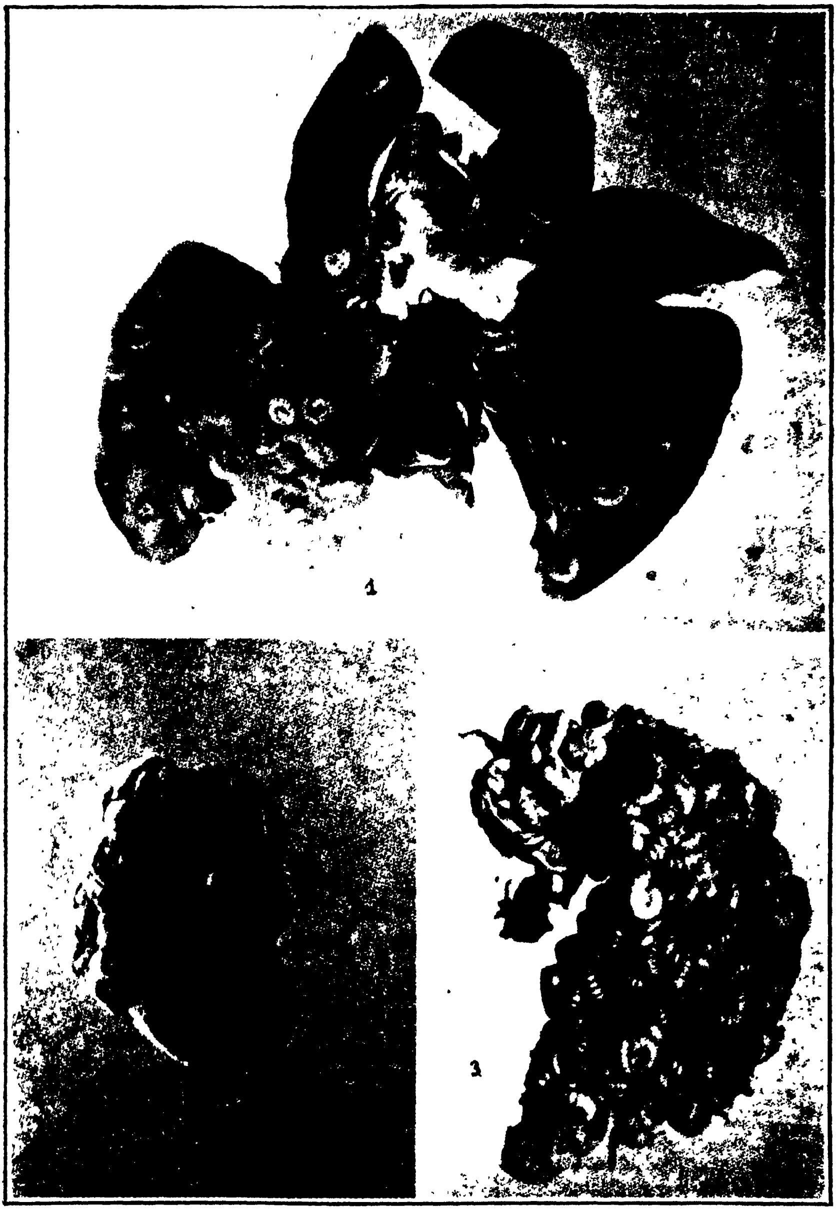


Fig 1 Lungs of genet with encysted larvae of Porocephalus.
,, 2. Larvae in capsule of the kidney.
,, 3. Mass of larvae in the peritoneum.

[Reproduced from the *Bulletin de la Société de Pathologie Exotique*.]

peritoneum everywhere, and the viscera, were profusely encrusted with encysted larvae of Porocephalus, as were also, to a less extent, the lungs (see figs.). The sexes of the larvae could be distinguished.

A list of the intermediary hosts of *Porocephalus armillatus* is appended. It includes man, chimpanzee, eleven species of monkeys, a lemur, lion, leopard and two other species of cats, domestic dog, four species of civets, aard-wolf, hedgehog, rat, guinea-pig, Cricetomys, pig and wild pig, river-hog, wart-hog, reed-buck, giraffe, and two species of antelopes.

A useful list of references is appended also.

A. A.

NOC (Fernand) & GIGLIOLI (George S.). **Linguatulids Parasitic in Monitors. The New Genus** *Sambonia.*—*Jl. Trop. Med. & Hyg.* 1922. Sept. 1. Vol. 25. No. 17. pp. 276–280. With 4 text figs.

The linguatulid of the Egyptian monitor lizard (*Varanus niloticus*) described by LOHRMANN, in 1889, as *Pentastomum clavatum* and after some taxonomic agitation at last brought to rest in SAMBON's genus *Sebekia* with the specific name *lohrmanni*, is now shown to be again in improper company. Its position among Sebekines is not indeed objectionable, but by its imbricating annuli, its non-serrated mouth-hooks encased in chitinous sheaths, its oviduct opening on the third antepenultimate segment, and its richly spinulose egg-shell, it possesses a sum of distinctive characters that entitle it to separate generic recognition from Sebekia. The authors, therefore, institute for its reception the new genus *Sambonia.*

A. A.

ANNANDALE (N.). **Notes on the Genera Bullinus and Physa in the Mediterranean Basin** (*Mollusca pulmonata*).—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 482–491. With 4 figs.

On the assumption that all or nearly all the many separately named forms that may be regarded as synonymous with *Bullinus truncatus* are capable of spreading *Schistosoma haematobium,* and that no species of Physa has that capability, the author here summarizes the difference between the Bullinus and two species of Physa that might be confused with it in the field. The soft parts exhibit much greater differences than the shell. The Bullinus also, being a Planorbid, has the characteristic red blood of the family.

A. A.

WALKER (F. D.). **Fish Poisoning in the Virgin Islands.**—*U.S. Nav. Med. Bull.* 1922. Aug. Vol. 17. No. 2. pp. 193 202. With 7 illustrations.

Every year cases of poisoning by fish occur in the Virgin Islands, generally in the months July–October, more rarely at other times. The symptoms are acutely gastro-intestinal, followed by weakness and itching ; occasionally there is syncope ; occasionally the resulting incapacity lasts for a month. The commoner species that have caused poisoning are (1) *Caranx latus* (yellow jack, horse-eyed jack), one of the Carangidae or horse-mackerels, which is particularly poisonous when caught in the deep sea and in summer, and when of large growth ; (2) *Scomberomorus cavalla* (king-fish), one of the Scombridae or mackerel family, poisoning from which can hardly be due to a toxin, since when perfectly fresh it is considered to be the finest of all the local food-fishes ; and (3) *Sphyraena barracuda* (fam. Sphyraenidae), the nature of the poison of which is also a matter of dispute, since small-sized fish are generally considered wholesome, and salted fish of larger size have been eaten without ill effects. The theory [not confined to the West Indies] is that individual fishes become poisonous from poisonous food or feeding-grounds.

A. A.

ESSERTEAU. **Note sur un poisson vulnérant en l'Ile d'Hainan.**—*Bull. Méd. Franco-Chinois.* Pekin. 1920. July-Oct. Vol. 1. No. 1. p. 39.

The venomous fish in this case appears to have been a small Scorpaenid of the genus *Aploactis.* The patient, a European, was wounded in the sole. He almost fainted with the pain, which spread over the whole plantar surface. In about a quarter of an hour the foot became red and slightly oedematous, and then somewhat numb. In about an hour these symptoms began to pass off, but for about three days the sole remained sore

A. A.

ARCHIVES DE MÉDECINE ET PHARMACIE NAVALES. 1922. July-Aug. Vol. 112. No. 4. p. 333.—**Deux accidents par piqûre de raie.**

Two cases of wounding by the caudal spine of sting-rays. One, a laceration of the hand, was followed by pain extending along the brachial plexus and neck, the wound itself being ecchymosed. The local pain was alleviated by incision and application of permanganate, but the pain along the nerves persisted for some days. The other, a deep wound of the foot, resembled a viper bite and was followed by hysterical symptoms, convulsions, and foaming at the mouth. Incision and injection of antivenomous serum soon gave relief, but vague pains along the course of the sciatic nerve continued for some days.

A. A.

STEWART (Douglas H.). **The Sting of the Sea-Nettle.**—*Boston Med. & Surg. Jl.* 1922. Aug. 31. Vol. 187. No. 9. pp. 337–339.

The author does not specify what is meant by " sea-nettle," whether a Medusa or a Portuguese man-o'-war. He has lately seen two cases of bathers stung by " sea-nettles " ; one was slashed across the mouth and chin, and the resulting rash resembled a severe herpes febrilis; the other was slashed across the face and also across the shoulders and back, and the resulting rash was rather erysipelatoid.

A. A.

GIGLIOLI (George). **The New Genus** *Alofia* **of the Family** *Linguatulidae.* **An Anatomical Account of** *A. ginae.*—*Jl. Trop. Med. & Hyg.* 1922. Dec. 1. Vol. 25. No. 23. pp. 371–377. With 5 text figs.

GORDON (R. M.). **The Susceptibility of the Individual to the Bites of** *Stegomyia calopus.*—*Ann. Trop. Med. & Parasit.* 1922. Oct. 18. Vol. 16. No. 3. pp. 229–234. With 1 fig.

HOFFMANN (W. H.). **Sobre la presencia de "** *Rhodnius prolixus* **Stal " en Cuba y su importancia médica.**—Reprinted from *Sanidad y Benefic. Boletin Oficial.* 1922. May & June. Vol. 27. Nos. 5 & 6. 4 pp.

ROUBAUD (E.) & FRANCHINI (G.). **Culture des parasites leishmaniformes obtenues chez la souris par inoculation des fèces de la Puce** *Ctenopsylla musculi.*—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1, pp. 14–15.

SAMBON (Louis Westenra). **A Synopsis of the Family** *Linguatulidae.*—*Jl. Trop. Med. & Hyg.* 1922. June 15. Vol. 25. No. 12. pp. 188–206. With 20 text-figs.; and Dec. 15. No. 24. pp. 389–428. With 25 text figs.

MISCELLANEOUS.

BALFOUR (Margaret I.). **Maternity Conditions in India.**—*Lancet.* 1922. June 10. pp. 1161–1162.

Maternity conditions in India, according to Dr. Balfour, are as bad as they can be. She describes the hereditary dai, or midwife, whose knowledge is picked up from her predecessor, who passes, with filthy clothes and person, from case to case and, without more than a perfunctory hand-cleansing, makes a practice of vaginal examination, so that septic infection is rampant; the objection of the immense majority of Indian women to the male medical practitioner, together with the very small number of women doctors; the inefficient teaching of midwifery to native students of both sexes owing to want of material in the hospitals, and their consequent lack of knowledge and skill; the backward state of the training of midwives, and the absence of inspection of the work of those who have passed examinations, and of punishment for malpraxis. The Government of India gives an annual grant of £25,000 for a Women's Medical Service, and one of £14,000 for the medical college for women at Delhi, but these sums are far below what is required. The infantile mortality over the whole country is 270 per mille and in Bengal 70 per cent. of this takes place in the first month. Ophthalmia and tetanus of the newly born are common. The frequency of osteomalacia and eclampsia call for investigation. She considers that a medical woman should be appointed to assist the Commissioner for Public Health and advise on measures for improving the conditions of childbirth [see also this *Bulletin,* Vol. 13, p. 321, where a book on the same subject is reviewed].

A. G. B.

KEUKENSCHRIJVER (N. C.) & DOORENBOS (W. B.). **Eenige statistische gegevens naar aanleiding van een duizend bevallingen in de kraaminrichting van de Holland-Amerikaansche Plantagemaatschappij te Kisaran.** [Statistical Data concerning a Thousand Deliveries in the Maternity Hospital of the Dutch-American Plantation Company at Kisaran.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1921. Vol. 61. No. 5. pp. 488–499. With 1 text fig. & 1 chart.

Contains much information about pregnancy and childbirth in Javanese women, the most important features being the following. Labour is very easy as a rule; in only 0·4 per cent. was instrumental extraction necessary. Albuminuria is less common than in Europe (½ per cent.), as is also eclampsia (0·2 per cent.). No real placenta praevia was found among the authors' cases. Twins are rare (9·6 per cent.); in Europe more than twice as many. The blood pressure did not show any noticeable rise during pregnancy. The external measurements of the pelvis are less than in European women; the internal measurements, however, are the same owing to the finer bones of Javanese women.

The mortality from childbirth and the children's mortality were considerably decreased by hospital treatment of the maternity cases and regular control of the babies. Only in four cases was breast feeding not sufficient. For more details the original should be seen.

W. J. Bais.

Hooton (A.). **Ether in the Tropics. A New Apparatus.**—*Indian Med. Gaz.* 1922. May. Vol. 57. No. 5. pp. 175–176. With 1 text fig.

The author notes that whereas ether has almost entirely superseded chloroform in British operating theatres, in India this is not the case. Chloroform is believed to be safer in a warm than in a temperate climate and the rapidity of evaporation of ether in India makes it expensive, as well as unpleasant for the anaesthetist. He finds that the ether purificatus of the B.P. can be replaced without risk by methylated ether and at a third of the cost; and he figures a closed apparatus designed by Pinson which in the 37 cases in which it has been tried in Rajkot has proved satisfactory, having all the advantages of open ether without some of its disadvantages. The apparatus may be obtained from the Condensed Gas Company, Ltd., 59, Grosvenor Street, Manchester, at about £6.

A. G. B.

Rosenberger (Georg). **Studien ueber die in- und extrazellulär liegenden Rickettsien.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Apr. Vol. 26. No. 4. pp. 112–119.

Here is related the discovery, in the course of experimental typhus investigations, of a Rickettsia (identified as *R. rocha-limae*) of the louse distinct from the *R. prowazeki* supposed to be the agent of typhus fever. The differences between the two species are tabulated.

R. prowazeki is constant in form though variable in size; the organisms are regularly distributed over the field of the microscope; they stain very lightly with aniline dyes; they are intracellular, and though they fill the cell they are individually distinguishable; they are extremely toxic, so that if a fair amount of them is injected into the louse's gut the insect dies in a few hours; lice do not become infected by mutual contact or by contact with the infected faeces.

R. rocha-limae besides being very variable in size is very variable in form; the organisms are in clumps in the field, like agglutinated bacilli; they stain somewhat better; they are both extra- and intracellular and when intracellular they are in clumps and are not easily distinguishable individually; they are not at all toxic to the louse; lice may become infected by mutual contact or by contact with the infected faeces.

A. A.

Butler (E. J.). **Some Relations between Vegetable and Human Pathology.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Jan. 19. Vol. 15. No. 7. pp. 203–211. (Discussion pp. 211–214.)

Dr. Butler, Director of the Imperial Bureau of Mycology, here shows that the problems which face the vegetable pathologist are in some instances akin to those of human pathology. An example is "virus" or "contagium" disease, in which the presence of a parasitic agent is suspected but none has been disclosed. The most important of several groups is the "mosaic" group from a form of which nearly every cultivated plant suffers. There is an incubation period which varies with the plant. "Carriers" are found, *i.e.* plants which show no symptoms, yet contain infective virus in a transmissible form. This group of diseases is insect-borne; aphids are chiefly responsible. In one instance "the insect has to be kept for a period of 24–48 hours after feeding on a diseased plant before it can inoculate a healthy one, after which it can remain infective for 100 days." After extraction from the plant dried tobacco mosaic virus lives for a year or more. The sap may be diluted 1,000 times without loss of virulence. The geographical distribution of a considerable group of plant diseases is correlated with the temperature and humidity reactions of the parasite and its host, and the author compares recent observations on epidemic malaria in the Punjab, which is dependent on a narrow range of humidity and temperature. Interesting observations are described, relating to crown gall tumour in plants, which suggest analogies with cancer. Here a virus has been cultivated.

A. G. B.

SHARPE (W. Salisbury). **Care and Treatment of the Ear in the Tropics.**—*Jl. Trop. Med. & Hyg.* 1922. Feb. 15. Vol. 25. No. 4. pp. 37–41. With 2 text figs.

A didactic paper in which the author, an assistant surgeon at the Central London Throat, Nose and Ear Hospital, describes the rudiments of examination of the ear and names the conditions which debar from a tropical career. He submits that a test of the hearing power and inspection of the ears of a candidate for the tropics is at least as important as an eye examination. The title hardly conveys an idea of the contents.

A. G. B.

FERNANDO (Antonio S.). **Clinical Notes on Ear, Nose and Throat Cases in the Dispensary of the Philippine General Hospital.**—*Jl. Philippine Islands Med. Assoc.* 1922. May–June. Vol. 2. No. 3. pp. 125–129.

We have here the statistics of four years in the Free Dispensary of the Philippine General Hospital where a yearly average of 12,000 ear, nose and throat cases is treated.

Among 784 cases of ear diseases seen in 1921 the most common were suppurative otitis media and furunculosis (448 and 210) and catarrhal otitis media (69); mastoid complications are uncommon (19 in 1920). The frequency of furunculosis is attributed to picking the ear with a tooth pick or match.

Diseases of the nose (956 in 1921) are headed by rhinitis, chronic hypertrophic, chronic and atrophic (322, 195 and 124); nasal polypi numbered 77; ulceration and submucous infiltrations 49, many due to yaws, others to syphilis.

Of 1,173 cases of diseases of the throat chronic hypertrophic tonsilitis cases numbered 268, acute and chronic pharyngitis 234 and 190; other forms of tonsilitis were numerous. There were 71 cases of tubercular laryngitis. Only 14 cases of adenoids are noted.

. A. G. B.

CASTELLANI (Aldo) & TAYLOR (Frank E.). **The Detection and Identification of Maltose, Galactose, Saccharose and Inulin, by a Mycological Method.**—*Jl. Trop. Med. & Hyg.* 1922. Feb. 15. Vol. 25. No. 4. pp. 41–46. With 1 text fig.

This method is based on the observation that germs are fastidious in the selection of the sugars of which they make use and [provided that their behaviour is constant] the fermentation of a sugar by one organism and its non-fermentation by another, their biochemical reactions being otherwise the same, furnish the clue to the identification of the sugar. Numerous instances are given in which various species of Monilia were employed and the paper closes with a list of "mycological formulae."

A. G. B.

RODHAIN (J.). **Les Roussettes africaines comme animaux de laboratoire.**—*Bull. Soc. Path. Exot.* 1922. Apr. 12. Vol. 15. No. 4. pp. 212–215. With 1 text fig.

VAN DEN BRANDEN has suggested the use of the common African bat, *Cynonycteris straminea,* as a laboratory animal [see this *Bulletin,* Vol. 11, p. 235]. The author has kept this in captivity at Boma as well as two other species of fruit-eating bats of the genus *Epomophorus.* He here gives notes of their capture and maintenance in captivity. He has had a Cynonycteris for 18 months which travelled for three months in a cage on a man's back; it bred in captivity. The natives catch it in snares baited with fruit. The other species are smaller and can be caught in the daytime, when they hang in clusters in certain trees, with an insect net on a bamboo pole. Provided the bats can suspend themselves from the top small cages do well; they must be kept very clean and in the shade. Large quantities of papays, bananas and mangos must be provided.

A. G. B.

NAPIER (L. E.). **The Differential Blood Count.**—*Indian Med. Gaz.* 1922. May. Vol. 57. No. 5. pp. 176–179. With 1 fig.

This paper is not intended as an answer to the question "Have differential leucocyte counts any value?" proposed by STEPHENS and YORKE and their collaborators, since the author was considering that question before that paper was published, and came to the conclusion that the answer depends upon the manner of the count. He has compared counts made by different methods and finds that the most uniform results are obtained by making a very small film and counting every leucocyte in that film. Another method approved by him is "method D." [I cannot find this method specifically described in the paper, but I infer from the context and the order of the figures that it consists in making a film, with a spreader having a slightly concave edge, exactly in two middle quarters of the slide, the film to have as few tails as possible; and counting the leucocytes in two complete lengths of it away from the longitudinal edge, not stopping at 500]. By "method D" the percentages of large mononuclears and polymorphonuclears are slightly increased. Whatever method be adopted not less than 400 leucocytes should be counted.

The author has found the differential count one of the most useful indicatives of progress towards recovery in kala azar patients and towards a definite leishmania infection in experimental animals.

A. A.

DE LANGEN (C. D.). **Het Cholesterinegehalte van het bloed in Indië.** [The Cholesterol Content of the Blood in the Dutch East Indies.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 1. pp. 1–4.

The author, who formerly considered the low cholesterol content of the blood as a specific property of the Malay race [this *Bulletin,* Vol. 9,

p. 260], has since altered his views and now joins VERHOEF [this *Bulletin*, Vol. 18, p. 262] in the opinion that it is caused by scarcity of fat in the diet. He found the cholesterol content in his recent experiments in better situated natives 0·11–0·15 per cent., *i.e.* significantly higher than in his former series in convicts. In native sufferers from tuberculosis a diet rich in cholesterol brought on a considerable rise of the cholesterol percentage of the blood.

W. J Bais.

POLIDORI (V.). **Autopyothérapie par réinjection de pus stérilisé au chloroforme.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1921. Dec. Vol. 12. No. 2. pp. 153–157.

By means of Dieulafoy's aspirator about 10 cc. of pus is drawn from the abscess into a vessel of 150 cc. capacity. Two cc. of pure chloroform are added, a paraffined cork is inserted and the whole violently shaken for about five minutes. The chloroform is then allowed to act for some hours after which 10 cc. of normal saline are added. Pus thus treated has always shown itself sterile on culture. Five cc. or less is injected into the buttock every other day or even daily. The local and general reaction is slight. The author has employed this method in eight cases of abscess, two of chronic bronchitis with abundant expectoration and one of pyuria, and in no case has harm resulted. Two cases of abscess are cited in which recovery ensued without the use of the knife, but pus was withdrawn by puncture on several occasions. The mode of action is discussed.

A. G. B.

GRAVES (M. L.). **Systemic Blastomycosis.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Mar. Vol. 2. No. 2. pp. 123–132. With 5 text figs.

Three months before his admission to hospital the patient, a negro from Texas, had noticed a warty projection on the forehead, he suffered from headache and, probably, fever. A month later a series of abscesses appeared which were lanced and continued to discharge. On admission pulse and respiration were rapid and there was irregular fever; four abscesses were present and four discharging sinuses. Two days before death there were signs of commencing consolidation in the lungs. Blastomyces were obtained from pus drawn from unopened abscesses. At autopsy the lungs was found studded with very numerous pin-point to pin-head size grayish areas of consolidation. Microscopically these consisted of proliferation of connective tissue and epithelioids with numerous giant cells in which the blastomyces were found, showing up as a lightly stained rim with granular centre. The author believes systemic blastomycosis to be a rare disease.

A. G. B.

LEGER (Marcel), HUCHARD (G. L.) & BAURY (A.). **Un cas de Sporotrichose pulmonaire.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 357–363.

The patient, aged 44, spent 2½ years on the West Coast of Africa in 1915–18. He was emaciated and complained of bouts of diarrhoea and bronchitis, night sweats and extreme lassitude. His fingers were hippocratic. The sputa were copious, mucoid or mucopurulent, sticky. Apart from slight dulness at the apices the physical signs were equivocal. The sputa were quite free from tubercle bacilli, inoculation of guinea-pigs was negative, but implantation on Sabouraud's test medium at laboratory temperature gave growth on the 5th and 6th day. The appearances on this and other media are described, and the form of the fungus under the microscope. It was identified as *Sporotrichum beurmanni* (Matruchot and Ramond, 1905). Pulmonary sporotrichosis is, the authors write, very rare; they mention three other cases. The patient left before iodide treatment could be instituted.

A. G. B.

KRAUS (R.). **El problema de la etiológia y patogenía del bocio endémico y del cretinismo.** [The Causation and Pathogenesis of Endemic Goitre and Cretinism.]—*Rev. Inst. Bacteriolog.* 1919. Oct. Vol. 2. No. 3. pp. 309–323. With 22 figs.

This paper contains an historical review of the question of the causation of endemic goitre.

In the second part, on cretinism, the author lays stress on the fact that the mother of a cretin is often goitrous (the father, though similarly afflicted, appears to have no adverse influence); in fact, he goes so far as to state that goitre in the mother is probably the first step on the road to cretinism, that the child of such is predisposed to the disease of which the direct cause may be some infective agent, since in non-endemic districts goitrous mothers give birth to healthy children. No attempt is made to bring forward any fresh points.

H. Harold Scott.

CABRERA (Cristina) & WADE (H. W.). **On the Iso-Agglutination Group Percentages of Filipino Bloods.**—*Jl. Philippine Islands Med. Assoc.* 1921. May–June. Vol. 1. No. 3. pp. 100–102.

CONCLUSIONS.

"The results of iso-agglutination tests of 204 Filipino bloods reveal distinct differences from the Moss group-percentages of both Americans (Moffit's figures) and Chinese. The number of Group I (1 per cent.) is extremely low; that of Group II (14·7 per cent.) is roughly 10 less than Chinese and 40 less than American; that of Group III (19·6 per cent.) is practically intermediate between the American (6 per cent.) and the Chinese (34 per cent.), while that of Group IV (64·7 per cent.) is roughly twice as great as either of the others, two-thirds of all specimens instead of one-third. In other words, there is a much lower incidence of agglutinogen, and presumably—though this is not actually demonstrated by the technic used—a correspondingly greater incidence of agglutinins than in American and Chinese bloods. Since practically two-thirds of the Filipinos, being of type IV, are universal donors, that is, have blood that is not agglutinated by the serum of any group, the chances for harmless transfusion with untested bloods are much better in Filipinos than in Americans or Chinese."

TABLE I.—Group Percentages of Filipino, Chinese and American Bloods.

Group.	Filipino.	Chinese. LIU & WANG.	American. MOFFIT, etc.	Moss.
	204	1,000	1,122	100
	Cases per cent.	Cases per cent.	Cases per cent.	Cases per cent.
I (2)	1·0	10·0	4·8	10
II (30)	14·7	25·1	53·6	40
III (40)	19·6	34·2	6·2	7
IV (132)	64·7	30·7	35·4	43

A. G. B.

DA MATTA (Alfredo). **II. Estudo synthetico do abacateiro e da castanheira. Aspectos economico e medicinal. Analyse de seus fructos. III. Existem vitaminas no abacate e na amendôa Brasileira ? Conclusão biologica affirmativa. Valor nutritivo de taes fructos por suas vitaminas e composição chimica ; calorias que fornecem.**—*Brazil-Medico.* 1922. Jan. 21. Year 36. Vol. 1. No. 3. pp. 33–38. With 1 fig. in text.

Studies of *Persea gratissima* and its fruit, the avocado or alligator pear, and of *Bertholletia excelsa* and its fruit, the Brazil nut. Animal feeding experiments carried out by the author with both fruits proved their richness in water soluble (B) vitamin.

F. S. Arnold.

GARCIA DE QUEVEDO (Luis). **Nociones sobre las glandulas endocrinas y su importancia en la patologia tropical.** [The Importance of the Endocrine Glands in Tropical Pathology.]—*Bol. Asoc. Med. de Puerto Rico.* 1922. Apr. Vol. 16. No. 136. pp. 65–73.

Almost the whole of this paper is taken up with an exposition of the functions of the endocrine glands and actions of hormones. The application of this to tropical pathology is limited to a few lines and is disappointing ; the examples given are supported by no evidence other than vague generalizations. Thus the fact that very few of the 17,000 recruits examined in Porto Rico during the late war exceeded 62 in. in height points, the author states, to " glandular deficiency," and is not due solely to heredity.

H. Harold Scott.

NOGUE, LEGER & HUDELLET (G.). **Un cas de leucémie lymphoïde à type splénique pur.**—*Bull. Soc. Path, Exot.* 1922. June 14. Vol. 15. No. 6. pp. 517–522. With 1 text fig.

Case of a mullah, beginning seven years before as a rapidly increasing tumour of the abdomen : antecedent syphilis denied, though Bordet-Wasserman reaction positive ; alcoholism excluded.

On admission a tumour as big as a full-term foetus is observed and found to consist of an enormous spleen with a small contribution from an enlarged liver, the patient being emaciated and anaemic. Careful examination at all points reveals nothing else positive except diminution in number of red blood cells (2,190,000), polychromatophilia, an enormous preponderance of large lymphocytes (62·5 per cent. in a differential blood count), and an unusual proportion of small lymphocytes (25·8 per cent).

Antisyphilitic treatment had no effect. But X-irradiation of spleen, with subsidiary arsenic and iron, effected a remarkable improvement.

After six irradiations, each of quarter of an hour, extending over a term of about two months, the spleen is considerably reduced ; the number of red blood cells is increased from 2,190,000 to 2,960,000 ; and of polymorphonuclear from 7 to 38 per cent., and the lymphocytes (large and small together) are reduced from 93 to 62 per cent., the reduction of the small lymphocytes being from 25·8 to 4 per cent.

The results of the X-ray treatment are already interesting, but the authors hope that continuation of the treatment will produce further benefit.

A. A.

DELANOË (P.). **De l'utilisation des tonneaux comme cages à animaux de laboratoire.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 420–423. With 2 figs.

Description and figures of the conversion of an ordinary oil-barrel, laid on its side, into a cage for laboratory animals.

A. A.

i. WELLS (A. H.), AGCAOILI (F.) & FELICIANO (R. T.). **Philippine Rice.** —*Philippine Jl. Sci.* 1922. Mar. Vol. 20. No. 3. pp. 353–361.

ii. SALVADOR (Wenceslao). **The Food Value of Philippine Bananas.**—*Ibid.* pp. 363–366.

iii. NEVEU (Raymond). **Les richesses thermales de l'Algérie.**—*Rev. Méd. et Hyg. Trop.* 1922. May–June. Vol. 14. No. 3. pp. 74–81.

iv. COUBA (Louis). **Des propriétés du sapotillier.**—*Ibid.* pp. 72–73.

v. ——. **Piscidia érythyna. De l'emploi de la piscidia érythyna dans certaines contrés d'Haiti.**—*Ibid.* pp. 73–74.

vi. MACHADO (Renato). **A propos d'un cas de Rhinosclérome.**—*Ibid.* pp. 65–70. With 5 text figs.

vii. PURDY (J. S.). **A Laboratory for Tropical Research.** [Correspondence.]—*Med. Jl. Australia.* 1922. June 17. 9th Year. Vol. 1. No. 24. p. 682.

viii. ROUTH (L. M.). **Surgical Anesthesia among British Troops in the Tropics.**—*Amer. Jl. Surg.* (Anesthesia Supplement.) 1921. July. Vol. 35. p. 66.

ix. HENRY. **La psychologie des indigènes et la médecine Européenne.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1919. June. Vol. 1. No. 2. pp. 6–16.

x. ANIGSTEIN (Ludwik). [In English.] **Obserwacje nad** "*Vibriothrix zeulanica*" **(Castellani).** [Some Observations on "*Vibriothrix zeulanica*" (Castellani).]—Reprinted from *Bull. Acad. Polonaise des Sci. et des Lettres.* (Classe des Sci. Math. et Nat.) Sér. B.: Sci. Nat. 1920. Jan.–Dec. 6 pp. With 1 plate.

xi. IACONO (Igino). **Alcune osservazioni sulla** *Vibriotrix zeylanica* **del Castellani.**—*Riforma Med.* 1922. Jan. 9. Vol. 38. No. 2. p. 32.

xii. ——. **A Brief Note on** *Vibriothrix zeylanica* **(Castellani, 1904).**—*Jl. Trop. Med. & Hyg.* 1922. Apr. 15. Vol. 25. No. 8. p. 100.

xiii. NICOLAS (Ch.). **L'Essence de Niaouli menacée dans sa production en Nouvelle-Calédonie.**—*Bull. Soc. Path. Exot.* 1921. July 13. Vol. 14. No. 7. pp. 396–397.

i. Gives tables with results of analysis of many varieties of rice and a comparison of Philippine rice with U.S.A. rice.

ii. Gives data of analyses of fruits of 12 varieties of banana.

iii. Algeria is rich in hot springs. The author classifies them as alkaline, sulphurous, ferruginous, saline, aerated, and simple, and states that there are 22 in Oran, 51 in the Algiers Department, and no less than 125 in Constantine. Details of the best known springs are given.

iv. A short account of *Achras sapota*, the Sapodilla plum and its medicinal properties.

v. *Piscidia erythrina*, the dog-wood of Jamaica, is a leguminous tree. It is believed to be used by the native of Haiti to poison his enemy, but the author seems to make fun of the tradition.

vi. According to the author rhinoscleroma is very rare in Brazil, though there appears to be a belief to the contrary. The patient was a negro, whose age is given as 118, and the affection of the nose had existed 22 years. It was complicated by myiasis. The condition improved with radium treatment, and a trial of tartar emetic was frustrated by the patient's death.

vii. A plea for the study of tropical diseases at Sydney University.

viii. A reprint of an article which appeared in the *Brit. Med. Jl.* in 1919 and was noticed in this *Bulletin*, Vol. 16, p. 225.

ix. An article containing nothing unfamiliar to those who practise among native Africans.

x, xi, xii. This organism and its reactions are sufficiently described in this *Bulletin*, Vol. 15, p. 308, and Vol. 16, p. 241.

xiii. The author refers to his paper on the essence of Niaouli and its uses in New Caledonia [see this *Bulletin*, Vol. 16, p. 244]. He here records that the existence of the tree is menaced by a fungus which began to attack it in 1919. He fears that the plant may become extinct.

A. G. B.

Alfonso Blanco (Ramón). **Apuntaciones prácticas sobre Parasitismo intestinal.** —*Gac. Med. de Caracas.* 1921. Nov. 30. Vol. 28. No. 22. pp. 341–345.

Banerjea (Sauranganath). **A Case of Homicidal Yellow Oleander Poisoning.**—*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. pp. 20–21.

Cornwall (J. W.). **What are the Departures from Health and the Diseases which arise from the Negligence, Ignorance and Self-Indulgence of Man?**—*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. pp. 15–17.

Dekester (M.) & Martin (E.). **Un cas de rhinosclorome au Maroc.**—*Ann. Dermat. et Syph.* 1921. Oct. 6th Ser. Vol. 2. No. 10. pp. 401–404. With 2 text figs.

Dupuy. **Accidents consécutifs à des injections intraveineuses de novarsénobenzol.** —*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.–Oct.–Nov.–Dec. Vol. 20 No. 3. pp. 385–389.

Ferré. **Note au sujet de la décomposition de l'eau de Javel aux Colonies.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 185–187.

Garcia (Faustino) & Guevara (Romulo). **Pharmacodynamics of** *Datura Alba.* —*Philippine Jl. Sci.* 1922. June. Vol. 20. No. 6. pp. 599–609. With 1 plate.

Gonzalez Martinez (I.). **Los metodos de laboratorio en el diagnostico de la diarrea cronica de los paises calidos.**—*Bol. Asoc. Med. de Puerto Rico.* 1922. Apr. Vol. 16. No. 136. pp. 51–58.

Granjux. **A propos du congrès de l'hygiène coloniale.**—*Rev. Méd. et Hyg. Trop.* 1922. Mar.–Apr. Vol. 14. No. 2. pp. 38–41.

Honeyman (S.). **A Bibliography of the Writings of the Late Sir Patrick Manson, G.C.M.G., LL.D., M.D., F.R.S., 1878–1919.**—*Jl. Trop. Med. & Hyg.* 1922. June 15. Vol. 25. No. 12. pp. 206–208.

Iacono (Igino). **La moniliasi bronchiale del Castellani.**—*Riforma Med.* 1922. May 27. Vol. 38. No. 13. pp. 303–304.

Natali (Augusto). **Anafilassi da chinino.**—*Ann. d' Igiene.* 1922. Nov. Vol. 32. No. 11. pp. 857–871.

Oberlé & Renaud (H. P. J.). **La pénétration pacifique par le médecin au Maroc depuis 1908.**—*Arch. Méd. et Pharm. Milit.* 1922. Sept. Vol. 77. No. 3. pp. 229–261. With 2 maps.

Ocaranza (Fernando). **Hématologie de l'Indien du plateau Central Mexican.**—*C.R. Soc. Biol.* 1923. Mar. 3. Vol. 88. No. 8. pp. 554–555.

Oshika (Hiroshi). **Zur Pharmakologie des Santonins. I. Mitteilung: Die Wirkung des Santonins und der Santoninsäure. II. Mitteilung: Die Wirkung des Aethyl-und Methylesters der Santoninsäure sowie des Aethylesters und des Natriumsalzes der Santonsäure.**—*Acta Scholae Med. Univ. Imperialis in Kioto.* 1922. Vol. 4. Nos. 2 & 3. pp. 281–293. With 5 text figs.; and pp. 421–434. With 9 text figs.

Pacella (G.). **Toxicité du tartrobismuthate sodicopotassique.**—*C.R. Soc. Biol.* 1923. Feb. 10. Vol. 88. No. 5. pp. 388–389.

Pérez Carreno (L.). **Notas clinicas acerca del paludismo la disenteria y la tuberculosis en el Estado Carabo.**—*Gac. Med. de Caracas.* 1921. Nov. 30. Vol. 28. No. 22. pp. 335–339.

Prat (Stéphane). **Le nomadisme et la propagation des maladies contagieuses au Maroc. (Essai de géographie et de démographie médicales.)**—*Arch. Méd. et Pharm. Milit.* 1922. Sept. Vol. 77. No. 3. pp. 287–297. With 4 maps.

Quintini (José). **Sobre Apendicitis parasitaria.**—*Gac. Med. de Caracas.* 1921. Oct. 31. Vol. No. 20. pp. 313–317.

Reynaud (G.). **Introduction à l'étude de la pathologie exotique.**—*Rev. Pratique des Maladies des Pays chauds.* Paris. 1922. Oct. Vol. 1. No. 1. pp. 1–7.

Rucker (W. C.). **Alastrim.**—*Public Health Rep.* 1921. Dec. 9. Vol. 36. No. 49. pp. 3024–3027.

Salisbury (Edward I.). **American Red Cross Work in Guatemala subsequent to Recent Guatemala Earthquakes.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1918. Jan.–June. Vol. 11. Pt. 1. pp. 29–34.

Scialom (D.). **Revue Tunisienne de pathologie exotique.**—*Rev. Méd. et Hyg. Trop.* 1922. July–Aug. Vol. 14. No. 4. pp. 97–108.

Sicé & Daude. **Coexistence du pian et de la trypanosomiase.**—*Bull. Soc. Méd. Chirurg. française de l' Ouest-Africain.* 1920. Nov. Vol. 2. No. 9. pp. 255–257.

Strong (Richard P.). **What Animal Experimentation has done for Exotic and Tropical Medicine.**—*Boston Med. & Surg. Jl.* 1923. Jan. 11. Vol. 188. No. 2. pp. 33–36.

TEBBUTT (A. H.) & McCONNEL (Sarah V.). **On Human Iso-Haemagglutinins, with a Note on their Distribution amongst some Australian Aborigines.** —*Med. Jl. Australia.* 1922. Feb. 25. 9th Year. Vol. 1. No. 8. pp. 201–209.

UBAGO (Manuel). **La médecine aux tropiques : la fièvre typhoide et ses formes. (Observations au Nicaragua.)**—*Rev. Méd. et Hyg. Trop.* 1922. Nov.–Dec. Vol. 14. No. 6. pp. 241–243.

VALLARINO (Joaquin J.). **Splenectomy as a Means of Treatment in Some Maladies.** —*Proc. Med. Assoc. Isthm. Canal Zone.* 1918. July–Dec. Vol. 11. Pt. 2. pp. 56–63.

DE VOGEL (W. Th.). **Overzicht der vorderingen van de tropische geneeskunde sinds 1913.**—*Nederl. Tijdschr. v. Geneesk.* 1922. Mar. 25. Vol. 66. Pt. 1. No. 12. pp. 1157–1167.

WELSH (R. H.). **The Problem of the Examination of Labour Recruits in the Transkeian Territories.**—*S. African Med. Rec.* 1922. Sept. 9. Vol. 20. No. 17. pp. 323–325.
[See this *Bulletin*, Vol. 20, p. 197.]

WIJDOOGHE (J.). **L'Hopital de la Niemba. Création d'un centre hospitalier au coeur de l'Afrique pendant la guerre.**—*Bruxelles-Médical.* 1922. Aug. 15. 2e année. No. 20. pp. 512–516. With 16 figs.

YAKIMOFF (W. L.), JOUKOWSKY (A. A.) & SCHIRWIND (S. L.). **Epidémie d'angine de Vincent.**—*Bull. Soc. Path. Exot.* 1921. Dec. 14. Vol. 14. No. 10. p. 631.

—— & WASSILEWSKY (W. J.). **Action du "Dissodoluargol" de Danysz et de "l'Arsolan" sur le bacille de Pfeiffer et la pneumocoque.**—*Bull. Soc. Path. Exot.* 1921. Dec. 14. Vol. 14. No. 10. pp. 630–631.

REVIEWS AND NOTICES.

PHYLACTOS (Adrien). **Lymphogranulomatose des Ganglions Inguinaux (Ulcère vénérien adénogène). Ses Rapports avec le Bubon Climatérique.**—204 pp. With 1 plate. 1922. Villefranche: Imprimerie du "Réveil du Beaujolais." 9 et 9 bis, rue Pierre-Morin. [Price not stated.]

In introducing his subject the author premises that in recent years considerable progress has been made in our knowledge of the pathology of the lymphatic system, the obscurities formerly surrounding it having in great measure been cleared away by close co-operation between clinic and laboratory. Remarkable results have in this way been achieved, and the rôle formerly attributed to tubercle and certain other infections as aetiological factors in glandular pathology found to have been far too extended.

The affection first described in 1913 by MM. DURAND, NICOLAS, and FAVRE under the provisional name of "Sub-acute Inguinal Lymphogranulomatosis" is cited as a case in point, and with the various aspects of this disease, historical, aetiological, clinical and pathological, the book proceeds to deal. Stress is laid throughout upon the identity of the malady with "Climatic Bubo," an ailment of hitherto unexplained aetiology which has long remained on the hands of tropical practitioners as an unsolved problem.

"Inguinal Lymphogranuloma" has been the subject of careful and prolonged observation and research in the clinic of M. FAVRE at the Hôtel Dieu de Lyon and in the Bacteriological Institute of that city, the work under review being largely an exposition of methods followed, theories advanced and to some extent proved, and conclusions arrived at by that distinguished physician and his collaborators. The disease is one of adult life, its maximum of frequency coinciding with the period of sexual activity. It is rare in women, unknown in children. Developing slowly as a subacute adenitis with periadenitis of the inguinal and iliac glands it progresses in an indolent and torpid fashion. The inflamed glandular mass never undergoes total destruction, but tends to present small localized points of softening and suppuration which may serve as the starting points of long-persisting fistulae. The prognosis is favourable but the disease by its long duration, its chronicity, and its intractability to treatment, is of serious local gravity and the cause of much disability. Its non-tubercular nature and its independence of the common pyogenic bacteria are satisfactorily demonstrated. Upon its venereal origin the author is insistent, as well as upon the fact that careful and systematic examination and observation will disclose the frequency of antecedent genital lesions, cutaneous rather than mucous, through which the virus of the disease has penetrated. These lesions, usually minute and often only of ephemeral duration, are not uncommonly missed or overlooked, but they are generally of a very definite and distinctive type. Of their histopathology and of that of the affected glands a detailed and careful description is given.

The school which the author represents regard the disease described as a fourth venereal affection, distinct from syphilis, soft chancre and gonococcal infection, from one and all of which the differential diagnosis presents no difficulties. Facts and arguments are adduced which certainly go a long way in proof of this contention. To the common form of primary lesion the name of "lymphogranulomatous chancre" is applied, but it is noted that a mild non-gonococcal urethritis is sometimes the initial manifestation. The disease may in rare cases run its course concurrently with other venereal infections, but in the absence of such association the results of bacteriological and protozoological investigations (including cultures and inoculations) may be taken as invariably negative. Attention is, however, specially drawn to the presence in abundance in the walls or cavities of the small glandular abscesses already mentioned, of refringent cellular inclusions, very evident in sections of the glands treated by special staining methods. These are suspected of possible parasitic significance, but may on the other hand represent nothing more than nuclear debris. The result of further investigation of this point will be awaited with interest.

There are no specific remedies. Rest, radiotherapy, and surgery represent the lines of treatment indicated. Early surgical intervention probably offers the best prospect of rapid recovery, ablation of the affected inguinal glands being followed by resolution in the iliac group.

The opinion is advanced and in great measure substantiated that "Lymphogranuloma" is one of the most common forms of adenitis observed in adults: that it has a wide distribution in torrid, temperate, and even frigid regions, and is in fact ubiquitous. The author does not appear to lay personal claim to tropical professional experience, but a very careful study of the literature of "Climatic Bubo" has evidently been made, and much weight of authority is quoted in support of the argument that "Lymphogranulomatosis" and "Climatic Bubo" are one and the same disease agreeing alike in constitutional and local manifestations. The necessity of distinguishing between climate as a predisposing and contributory factor and as an actual causative agent is emphasized, and the fact that "Lymphogranuloma" is most frequent in hot and tropical climates is held to constitute the whole secret of "Climatic Bubo."

No information is furnished by the author (probably because none was available) regarding the proportion or frequency of cases of "Lymphogranuloma" which do not proceed to softening or fistulization, but slowly resolve under expectant treatment even when radiotherapy is unobtainable. Progress of this nature has long been looked upon as one of the leading features of "Climatic Bubo," and a doubt will still exist in the minds of many tropical observers whether the nature of all the glandular conditions classed under that head has been completely elucidated, though with the reviewer they may admit that light has been thrown on the probable aetiology of the considerable proportion of such cases the innocence of whose origin has been the subject of not unnatural scepticism.

The book well repays perusal in spite of the author's tendency to iteration. Interesting details of cases are furnished, and the copious bibliography appended testifies to the industry and care expended on its production.

J. J. Pratt.

BERNARD (P. Noel) *et al.* **Centenaire de Louis Pasteur 1822-1895. Les Instituts Pasteur d'Indochine.**—249 pp. 1922. Saigon: Imprimerie Nouvelle. Albert Portail.

We have here—a fitting tribute from the savants of the Far East to the Master's centenary—a most interesting account of the Institutes at Saigon and Nhatrang that bear the name of Pasteur. These institutions, which came into existence independently as instruments of the local government—Saigon in 1890 under CALMETTE, Nhatrang under YERSIN in 1895, were directly affiliated to the Pasteur Institute of Paris in 1904-5, as the Pasteur Institutes of Indo-China.

Although neither institute is exclusive in its scope Saigon is more particularly identified with antirabic operations, anti-variola vaccination, antivenenes, and medical affairs, Nhatrang with antiplague work and with veterinary interests.

Since its installation under CALMETTE as a modest adjunct of the local army hospital the institution at Saigon has undergone the usual reconstructions due to growth. As a Pasteur Institute it is now housed in three large two-storey buildings (with the necessary annexes for animals, etc.) containing, respectively, the laboratories of microbiology, vaccines, and chemistry. The scientific staff includes a director and the respective chiefs (each with a European deputy and native assistants) of the four departments of medical microbiology, vaccines, animal microbiology, and chemistry, the chemical department also including a sectional chief for the somewhat extraneous subject of economic vegetable products.

The institute at Nhatrang was an immediate outcome of YERSIN's great discovery of the plague bacillus and began as a modest depot for the preparation of antiplague serum. It is now an immense establishment, where antiplague and anticholera vaccines and many therapeutic and diagnostic serums in use in medical and veterinary practice are manufactured on an extensive scale. Courses of practical instruction for junior veterinary officers and young native subordinates of the veterinary department are given also. The scientific staff includes a director and the chiefs (each with a European deputy) of the two departments of animal microbiology and chemistry. The biological laboratories are housed in a large two-storey building that forms the front of a quadrangle of stables and stalls. The chemical laboratories are situated at Suoi-Giao, 19 km. distant, on the plain, a forest reserve of about 1,200 acres where also there are cattle-parks and stables, and plantations of cocoa, coffee, rubber, and other plants. Also attached to the institute is the hill station of Hong-Ba, about 30 km. from Nhatrang, which is to be developed as an acclimatization station for interesting plants and a meteorological observatory. There are very few mosquitoes and no anopheles at this charming hill station.

A most pious feature of this centenary tribute is the summary and analysis of the original work accomplished and published by the Pasteur Institutes of Indo-China since their inception. This, which is classified under 39 headings and completed by a bibliographic index, ranges over the whole field of tropical medicine and hygiene—a magnificent record for a country so far from Europe and so recently recruited to European science. We may signalize here, without offence to the successors of those worthy disciples of Pasteur, the work of CALMETTE on snake-venoms and antivenenes, on the production of a rabic virus and of a small-pox vaccine suitable for general use in Indo-China, on Chinese yeast, on dysentery; and on the local drinking water; and the work of YERSIN, so admirably summarized in this volume, on plague. In a new sense we may well apply to the alumni of the Pasteur Institute in Indo-China the old saying "coelum non animum mutant qui trans mare currunt."

A. Alcock.

DANIELS (C. W.) [M.B., F.R.C.P., formerly Director of the London School of Tropical Medicine; Consulting Physician Hospital for Tropical Diseases] & NEWHAM (H. B.) [C.M.G. M.D., Director of the Department of Tropical Pathology and Warden of Studies, London School of Tropical Medicine]. **Laboratory Studies in Tropical Medicine.** 5th Edition. Thoroughly Revised. pp. xiii + 576. With 7 plates & 184 figs. 1923. London: John Bale, Sons & Danielsson, Ltd., Oxford House, 83–91, Great Titchfield Street, W.1. [Price 25*s*. net.]

The new edition of this well-known manual will be read with interest.

Chap. I (27 pages) deals with the laboratory and its equipment, and in the main follows the lines of the preceding edition. There is an additional section wherein the methods of housing, feeding and breeding the various laboratory animals are described in a most practical manner.

Post-mortem examinations, and the preparation of tissues for section cutting, etc., receive 17 pages in Chap. II.

Chaps. III–VI (73 pages) include the study of normal and abnormal blood conditions. The statement that large mononuclear leucocytes contain red staining granules, which are not found in lymphocytes (large and small), will not meet with general acceptance. Moreover, the beginner is likely to seize on such an easily determined character for the recognition of large mononuclears, a method of diagnosis which will give results widely differing from those obtained when other tests are applied. Plate VI must have been reproduced from a poorly stained blood smear, and gives an inadequate representation of blood corpuscles. The cell labelled " transitional " bears no resemblance to the description in the text. The various steps in a Wassermann reaction are described clearly and in detail, but there is no mention of the Sigma test, which would commend itself to the single-handed worker by reason of its simplicity.

The blood protozoa are allotted 69 pages in Chaps. VII–IX. Most of the material is reproduced from the preceding edition, but the subject-matter has been rearranged, with additions, and the section on Spirochaetes is new. This includes the NOGUCHI-WENYON method of culture, and the use of the " bleeding box."

DOBELL's descriptions of the amoebae of man are followed in the chapters on intestinal protozoa, and his figures of these parasites are clearly reproduced. The same author's illustrations of the Coccidia occurring in man are an excellent addition.

Chap. XIII (urine) includes CHRISTOPHERS and STEPHENS's method for estimating quinine in the urine. The ordinary man would find the acid Tanret test invaluable in deciding whether cases under treatment are absorbing the quinine administered. Also, the precipitate in the urine can be diluted and an idea of the quinine content obtained by comparison with standards containing known amounts of quinine, on the principle adopted in standardization of vaccines by turbidity tests. Such a method of estimation might not meet with the approval of the bio-chemist, but it is quite sufficient for clinical work.

Bacteriology, including the preparation of media, isolation of organisms from blood and faeces, agglutinations, etc., receives 57 pages in Chap. XIV, which will enable the learner to face confidently any examinations likely to be required. The short Chap. XV gives directions for measuring microscopic objects, including a useful account of the camera lucida.

In Chaps. XVI–XVIII (70 pages) the parasitic helminths of man are described in sufficient detail for the purposes of the book. Looss's figure of a male and female *Schistosoma*—which time cannot wither nor custom stale—is included, and is labelled *S. haematobium*, but the species depicted is surely *S. mansoni*. The authors follow the curiously prevalent custom of writing " *Microfilaria bancrofti* " and " *Microfilaria loa*." Any zoologist unfamiliar with the group would in consequence suppose these worms to be species of a genus *Microfilaria* !

Here the reader twitches his mantle blue and enters on the fresh fields of the Arthopoda, to which the remainder of the book (161 pages) is devoted. Parts of this division have been rewritten, notably the chapter on the classification of mosquitoes, for which the authors draw largely on Colonel ALCOCK's standard treatise. Unfortunately some other parts have not been similarly revised, but remain strongly tinctured with the traditions of an earlier dispensation, and elusive genera and other groups crop up which, like Bacon's *Idola Fori*, have only their names as evidence of existence. The chapter on dissection of mosquitoes is excellent. A clear description of the procedure for displaying the genitalia of Glossina is a useful addition to the section on this genus, but it is a pity that the authors have seen fit to include in their table of tsetse-flies only nine species, and one of these of very doubtful validity.

There is some confusion in setting out familial and generic characters. Thus, the Muscidae are stated to have four visible abdominal segments. The application of such a diagnostic test would exclude, for a start, the most important genus in the family—*Glossina*.

The foregoing indicates sufficiently the scope of the book. It contains much excellent matter, and the student who familiarizes himself with its teachings will possess a good basis for laboratory work. At the same time the method of instruction sometimes appears unnecessarily diffuse, and there is much needless repetition. Further, various zoological groups are not always given the same designation, nor are terms always applied in the same sense. For example, the definition of Culicidae, on p. 446, admits the Corethrines, whereas that on p. 397 excludes them. On p. 222 the Sporozoa are divided into Neosporidia and Telosporidia, but Coccidiomorpha and Gregarinida are the subclasses recognized three pages further on. Whether these discrepancies result from insufficient revision, or are a deliberate halting between two opinions, they are likely to confuse the beginner. No system of classification, nor any other human performance, can be expected to obtain universal approval. Besides the tolerant critic, the "selfconceited Brethren who give liking unto nothing but what is framed by themselves and hammered on their anvil" are likely to be active, as they were against the translators of King James' Bible. Consequently, since finality is impossible, it would surely be better to select whatever zoological grouping seems most suitable, and adhere to that throughout, leaving the quiddities and quillets to the austere zoologist.

The publication of a fifth edition of this manual is sufficient evidence that it supplies a recognized need, and the reviewer is happy to acknowledge his indebtedness to an earlier edition for valued assistance. He considers, however, that by judicious compression and further revision its usefulness and scope could be greatly increased without any departure from the object of the authors.

W. P. MacArthur.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 6.

MEDICAL ZOOLOGY.

WENYON (C. Morley). **Microscopic Parasites and their Carriers.**—Read before the Royal Institution of Great Britain, Weekly Evening Meeting, Friday, Mar. 3, 1922. 19 pp. With 9 figs.

A broad and instructive account, easy of assimilation by reason of the figures and ingenious diagrams that illustrate it, of the intestinal protozoa, of the malaria and piroplasma parasites, and of various types of trypanosomes and spirochaetes, and of the various vehicles and roads by which they are severally accommodated and passed from one vertebrate host to another. While keeping entirely clear of any suspicion of metaphysical hair-splitting, the author shows that it cannot be the natural interest of a parasitic species to do mortal hurt to its host, and therefore that the pathological aspects of parasitology are, like pathology in general, manifestations of the abnormal.

A. Alcock.

KUENEN (W. A.). **Amoebiasis ; Protozoology ; Role of the Helminths.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 150–161.

In opposition to DOBELL the author agrees with those who regard the *minuta* form of *E. histolytica* as a harmless parasite—living on the surface of the intestinal epithelium, multiplying, and producing cysts—of the healthy resistant human " carrier." Should the healthy epithelial resistance break down, the *minuta* grows into the big, invasive, harmful *histolytica* form. One of the most frequent causes of this collapse is a concomitant or supervening infestation with worms, particularly hookworm. " In fighting endemic amoebiasis one will hardly have success unless at the same time energetic measures be taken against the spreading of helminthiasis."

A. A.

THOMAS (W. S.). **The Intestinal Protozoa in a Series of Three Hundred and Eighty-Two Patients.**—*Clifton Med. Bull.* New York. 1922. Oct. Vol. 8. No. 2. pp. 27–30.

This paper summarizes and discusses the results of systematic observations extending continuously over 27 months. Its aim is to show, by comparison of the latest with the earliest observations of the series, how untrustworthy the statistics of a beginner in this field are. The species found are those commonly known.

A. A.

TANON (L.). **A propos de quelques progrès réalisés dans la thérapeutique des maladies à protozoaires.**—*Rev. Pratique des Maladies des Pays chauds.* Paris. 1922. Oct. Vol. 1. No. 1. pp. 18–24.

This is a preceptive paper for the behoof of medical men at home who nowadays come a good deal in touch with patients suffering from the diseases called tropical. It starts with the admission, gratifying to the apostles of Apollo and Æsculapius and Hygeia who labour in tropical fields, that the ætiology and treatment of tropical diseases keep in pace together. Though devoted mainly to describing the treatment of bilharziasis initiated by CHRISTOPHERSON, it has something to say about the specific treatment of other specific diseases commonly prevalent in tropical latitudes. Apropos the treatment of amoebiasis by emetine associated with the name of ROGERS, it resuscitates some interesting historical facts, as that the famous PELLETIER and MAJENDIE isolated emetine in 1819 and proposed its use in the treatment of dysentery. But their emetine was not quite pure, and patients for experiment were scarce, so their suggestion was not followed up, although Lomasc BARTHOLEY revived it in 1829. As recent authors have remarked, emetine appeared before its time. The fact that Tull WALSH in 1891 recommended a combination of emetine and iodide of mercury as the proper treatment for dysentery is also mentioned.

[The facts that PISO, in 1648, explicitly stated that ipecacuanha was a specific cure for dysentery, and that Surgeon G. PLAYFAIR, of the East India Service, successfully attested the remedy in 1813, might also, perhaps, have been brought in.]

A. A.

IRIYE (Hideya). **[Experimental Studies on the Action of Emetin against Protozoas, in Special Reference to the Influence of the Reaction of the Solvent on its Action and the Mixed Administration of Emetin with some other Drugs.]**—*Nisshin Igaku* (*Progress in Med.*). 1922. May. Vol. 11. No. 9. [Summarized in *Japan Med. World.* Tokyo. 1922. Oct. 15. Vol. 2. No. 10. p. 300.]

In these experiments the lethal effect of emetine hydrochloride upon amoeba and paramoecium was strongest in an alkaline, weakest in an acid medium, an alkaline solution of 0·0005 per cent. being fully lethal; the effect of emetine was accelerated, in respective order, by arsenites, corrosive sublimate, and tartar emetic. The organisms mentioned could become tolerant of emetine by long-continued cultivation in a sufficiently dilute solution, the amoebae undergoing a correspondent change of form.

A. A.

HEGNER (Robert W.). **The Effects of Changes in Diet on the Incidence, Distribution and Numbers of Certain Intestinal Protozoa of Frog and Toad Tadpoles.**—*Jl. Parasit.* 1922. Dec. Vol. 9. No. 2. pp. 51–67. With 3 text figs.

The change from tadpole to frog normally involves among other things arrangements for a complete change of diet, and the author has thus discovered an ingeniously instructive field in the observation of the effects of this natural change on the intestinal protozoa of these animals. He finds that *Rana clamitans* is infested with Opalina in the tadpole stage; that during metamorphosis the Opalinae first accumulate in the rectum, then resort entirely to the intestine, then disappear altogether; and that in the final full-blown frog they are not found at any time of life, not even, it would seem, by re-infection. With *Rana pipiens* and *Bufo lentiginosus*, however, infestation with Opalina is continuous from tadpole to full-blown and adult frog and toad. *Rana clamitans* (like the other species) is also infested with Nyctotherus, Trichomonas, and Hexamitus, but these do not disappear in the frog stage, and the infestation is probably continuous from tadpole to adult.

The author has also studied experimentally the effects upon the intestinal protozoa of feeding tadpoles on various gland-substances; the results are interesting and considerably suggestive, though they cannot at present be called definitely illuminative.

In one set of experiments he found that Opalina, Nyctotherus, Trichomonas, and Hexamitus decreased both in incidence and in numbers in tadpoles fed on thyroid—a substance that is known to influence the intestine itself. In another set of experiments he found that feeding on thyroid brought about a change in the distribution of the protozoa similar to the temporary change in distribution that occurs normally during metamorphosis, namely, that they were eliminated from (or diminished in) the rectum (their normal habitat) and accumulated in the intestine (which normally is almost free from protozoa).

The holozoic Nyctotherus and Trichomonas were found to decrease in incidence but to increase in numbers, and the osmotically-nourished Opalina and Hexamitus to decrease in incidence and in numbers, in tadpoles fed on thymus, ovarian, and testicular substance.

The author's main conclusion is that his experiments give countenance to the hypothesis that the intestinal protozoa are influenced not directly by what the host feeds on but indirectly by the effect of the food on the digestive tract of the host.

A. A.

SOKOLOFF (Boris). **Le noyau est-il indispensable à la régénération des Protozoaires ?**—*C.R. Soc. Biol.* 1922. Dec. 2. Vol. 87. No. 36. pp. 1144–1147. With 1 text fig.

Amputated fragments of Dileptus and Bursaria not containing nucleus recovered the specific contour but did not live long; in some of the amputated pieces (of Bursaria) thus recovering shape small fragments of chromatinic origin were disseminated. The author's conclusion is that the nucleus is necessary for vital activity but not for partial regeneration.

A. A.

BLANCHARD (M.) & LEFROU (G.). **La recherche des parasites sanguicoles extraglobulaires par la méthode de la triple centrifugation du sang.** —*Presse Méd.* 1922. Nov. 25. Vol. 30. No. 94. pp. 1020–1021.

An advocacy of the method of triple centrifugation for the collection of extra-corpuscular blood-parasites.

Of the blood to be examined 10 cc. is well mixed with 1 cc. of a 20 per cent. sodium-citrate solution and is then centrifugated for about 10 minutes to separate the mass of the red cells. The plasma is decanted and submitted to a second centrifugation for 10 minutes; in the sediment of this second operation will be found, along with a few red cells and haematoblasts, the leucocytes, any microfilariae, and (in heavy infections) some trypanosomes. The plasma of the second operation is then decanted and centrifugated for a third time of 10 minutes; in the sediment of this third operation will be found, along with a few remaining blood cells, any trypanosomes and spirochaetes that are present, and, possibly, cocci and bacilli. At Brazzaville the examination of blood by triple centrifugation is a part of the routine.

A. A.

RODRIGUES (Sebastian L.). **The Rationale of the Treatment of Protozoal Diseases by Organic Acid Salts.**—10 pp. [Printed proof supplied by Author, Nov. 13, 1922.]

"On the theory that at blood-heat organic acid salts have been found to act as lethal katabolic toxins to some protozoal parasites," the writer recommends that such salts should be generally used in the treatment of diseases due or supposed to be due to protozoa.

A. A.

HEGNER (Robert W.) & BECKER (Elery R.). **The Diagnosis of Intestinal Flagellates by Culture Methods.**—*Jl. Parasit.* 1922. Sept. Vol. 9. No. 1. pp. 15–23.

Since the Chilomastix, Trichomonas, Embadomonas, and Enteromonas that occur in the human intestine are easily cultivated in a mixture of egg albumin and normal saline solution, the authors recommend the examination of stools by the culture method rather than the smear method.

A. A.

SHORTT (H. E.). *Herpetomonas Ctenocephali*, **Fantham; Some Observations on its Life History and Reactions to Different Environments.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 721–738. With 3 plates & 2 text figs.

The purpose of the study of this extremely convenient flagellate is to clear the way for its employment in the experimental investigation of herpetomonad infections of vertebrates. The paper is therefore well worth attention, particularly as it specifies certain fallacious micro-organisms that may be encountered in the gut of the flea.

The author cannot confirm for the dog-flea the general statement issued by some observers that pure culture of the flagellates of fleas is facilitated by any freedom of the gut of the flea from bacteria. For pure culture females (for greater convenience) are washed in 10 or 12 changes of sterile normal citrate saline solution and are then removed under sterile conditions to flamed slides for individual dissection. The alimentary tract being removed, by separating the terminal segments of the abdomen, inspection of the hindgut and rectum, if these parts are distended and have a "ground glass" appearance, gives evidence of a heavy infestation with flagellates. The infested parts are removed with a capillary pipette and washed in several changes of the citrate saline, and their contents are then pipetted and sown in several tubes of N.N.N. medium—all operations, of course, being sterilized ; in some of these tubes a pure culture will occur, for subculture The observed optimum temperature for growth was 22°–24° C. ; active forms were abundant after 48 hours, and after 7 days the water of condensation was creamy with them. Successful cultures were obtained in other media, even in ordinary agar, without any blood but with merely a few drops of normal citrate saline.

The various forms of *H. ctenocephali* found in the flea's gut are described and figured, non-flagellate forms occurred only in the rectum.

Bed-bugs were fed on cultures (or flea-guts) mixed with citrated blood. After 24 hours enormous numbers of active flagellates could be found in the bug's stomach ; but by the eighth day very few remained, though a few could still be found in its hindgut. By following a modification of the method of CORNWALL and LE FRENAIS in their study of the kala azar parasite, "thick tails" could be produced.

Snake-venom (cobra and Russell's viper) in half per cent. solution had no immediate lethal effect on *H. ctenocephali.*

Cultures of *H. ctenocephali* ingeniously introduced into small pockets of living *Euphorbia royleana* and secured from evaporation multiplied there and produced the peculiar elongate, slender, twisted, posteriorly-tapering forms usually characteristic of Euphorbia flagellates ; they did not, however, spread beyond the site of inoculation.

Normal blood-serum of monkeys (Macacus) was found to be distinctly lethal to *H. ctenocephali,* and the serum of a monkey that had had a long course of inoculations with cultures of the flagellate was more quickly fatal than other specimens of monkey serum.

Of other micro-organisms found in fleas infected with Herpetomonas, *Nosema pulicis* (which may be found even in the salivary glands) is particularly mentioned.

A. A.

LYNCH (Kenneth M.). **Cultivation of Trichomonas from the Human Mouth, Vagina, and Urine.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 531–538.

The author describes the various simple media that have been used for the cultivation of Trichomonas of human source and states that the uniformly best of them is "human blood-serum diluted with ten volumes of 0·5 per cent. NaCl solution." In this medium growth usually is steadily progressive for four or five days, but very soon after that the organisms disappear. Growth goes on best at the bottom of a fairly long tube of the medium.

The author is of opinion that *T. vaginalis* and *T. buccalis* are identical.

A. A.

HOGUE (Mary Jane). **A Study of *Trichomonas hominis*, its Cultivation, its Inoculation into Animals, and its Staining Reaction to Vital Dyes.**—*Bull. Johns Hopkins Hosp.* 1922. Dec. Vol. 33. No. 382. pp. 437–440. With 4 figs.

An excellent medium for cultivation of *Trichomonas hominis* is sodium-chloride serum-water. Dilute one part of (preferably) sheep-serum with three parts of distilled water and sterilize at 100° C. for one hour on three successive days. Add 10–15 cc. of this serum-water to 100 cc. of 0·85 per cent. sterile NaCl. solution. Inoculate the depths of a test tube containing 15 cc. of the medium with Trichomonas by means of a capillary pipette, and cover the surface with sterile paraffin oil to prevent evaporation. Incubate at 36° C. Such cultures will live for 35–66 days. In this medium with a pH 8 the organism multiplies most rapidly, and with a pH 7·2–7·4 lives longest.

A. A.

SIMON (Charles E.). **A Critique of the Supposed Rodent Origin of Human Giardiasis.**—*Amer. Jl. Hyg.* Baltimore. 1922. July. Vol. 2. No. 4. pp. 406–434. With 1 plate, 3 figs. & 6 charts.

This is a paper to which it is hardly possible to do justice in the short space allowable to a review; and all interested in the subject with which it deals are therefore recommended to study the original, which evidently embodies the results of much careful work. The author's chief arguments and conclusions may be shortly summarized as follows.

As is well known; representatives of the flagellate genus *Giardia* (better known as *Lamblia*) occur in many different vertebrates. The author has made an intensive study of three of them—that in man (which is here called *G. lamblia*), that in the common mouse and rat (*G. muris*), and that in field-voles or "meadow mice" (*G. microti*). On grounds furnished by a cytological, biometric, and experimental study of these forms, the author comes to the conclusion—which appears well founded—that they represent three distinct and "good" species. He believes that they can be distinguished by means of slight morphological differences observable in the active flagellates—though little diversity can be detected in their cysts—and by means of their relative and absolute dimensions. *G. lamblia* [=*G. intestinalis*] is comparatively large and slender, *G. muris* small and plump, while *G. microti* appears to be somewhat intermediate in size and shape. *G. muris* was found in laboratory mice and rats, but never in wild ones [which seems curious, since it undoubtedly occurs in these animals in other parts of the world]. *G. microti* was studied in the Californian vole (*Microtus californicus*) and in a Nova Scotian species identified as *M. pennsylvanicus acadicus*. This species of Giardia is probably identical, in the author's opinion, with the form long ago recorded from the Italian vole "*Arvicola arvalis*" by GRASSI, and with that more recently found in Italy by SPLENDORE in *Pitymys savii*, and by him named "*G. pitymysi*." The biometric evidence for regarding "*G. lamblia*," *G. muris*, and *G. microti* as specifically distinct from one another is exhibited in a series of tables and curves.

The experimental evidence for regarding these three species as distinct appears to clinch the matter. It was found, by carefully conducted experiments, that *G. muris* could be readily transmitted from mouse to mouse, from mouse to rat, and from rat to rat. Wild mice and rats (invariably found, as noted already, uninfected in nature) were easily infected experimentally with material from infected laboratory-bred animals. Experiment showed, however, that it was apparently impossible to infect wild mice and rats, or laboratory rats, with *G. microti* (from wild voles).

Perhaps even more interesting were the author's experiments with the Giardia of man. By feeding the cysts of this species to wild and laboratory-bred rats, attempts were made to infect these rodents with the species normally living in man; but in every case the result was entirely negative. None of the rats became infected, and—which is noteworthy also—"none of the animals showed any signs of sickness, viz., diarrhoea." The author's results were thus, as he says, "diametrically opposed" to those reached by FANTHAM, PORTER, and DESCHIENS [and, it may be added, by several other workers], who have recorded positive results from similar experiments.

From all his studies the author finally reaches the general conclusion that "there is no basis for the assumption that the human infection [with Giardia] is referable to either rats, mice, or meadow mice" [though his experiments actually prove, directly, a converse proposition —that the rat cannot be infected with the Giardia of man]; and he gives it as his opinion, consequently, that "human giardiasis is not of rodent origin, so far as the mouse type is concerned," and that "the human infection is of human origin" [an inference in support of which no experimental evidence is here adduced]. With these general conclusions many protozoologists—especially those who, like the reviewer, have already expressed similar opinions—will doubtless find themselves in essential agreement: and it seems worth adding that, if these conclusions are correct—as there is every reason to believe they are—then they effectively demolish all the experimental evidence hitherto advanced in favour of the hypothesis that the Giardia of man is a pathogenic parasite, since its pathogenic effects (if it is capable of producing any) obviously cannot be demonstrated in a host—such as a mouse—which is, in reality, incapable of acquiring an infection.

[In the opinion of the reviewer this paper is a valuable experimental contribution to a question which has hitherto been considerably vitiated and confused by lack of accurate data, and a superfluity of ill-founded deductive reasoning and premature speculation.]

Clifford Dobell.

i. HEGNER (Robert W.). **The Systematic Relationship of** ***Giardia lamblia*** **Stiles, 1915, from Man and** ***Giardia agilis*** **Kunstler, 1882, from the Tadpole.**—*Amer. Jl. Hyg.* Baltimore. 1922. July. Vol. 2. No. 4. pp. 435–441. With 3 text figs.

ii. ——. **A Comparative Study of the Giardias living in Man, Rabbit, and Dog.**—*Ibid.* pp. 442–454. With 14 text figs.

i. In this paper the author describes a species of *Giardia* occurring in the tadpoles of frogs, and compares it with that found in man. He identifies the former with *G. agilis* Kunstler, and adopts the designation *G. lamblia* Stiles for the latter.

G. agilis was obtained from the larvae of *Rana clamitans*, collected at Chester, Nova Scotia, in June and July. Measurements of 100 stained flagellates from 17 tadpoles lead the author to the conclusion that the mean length of *G. agilis* is 22μ, its mean width 4·5μ. The dimensions of the flagellates in different tadpoles, however, were found to differ considerably—a fact which the author explains by suggesting that "heritably diverse races of *G. agilis* may exist with respect to size, or else size may be influenced by different environmental conditions in the intestines of different hosts." [As not more than 15 individuals appear to have been measured from any one tadpole, the statistical basis for any inference regarding the existence of races seems very insecure.] The measurements obtained are compared with those of the Giardia of man, as given by SIMON (*Amer. Jl. Hyg.* (1921), i. 440).

As a result of his observations and comparison, the author decides that *G. agilis* is morphologically sufficiently like the species occurring in man to be placed in the same genus, but not sufficiently unlike to warrant its being put in a separate subgenus—as proposed recently by REULING and RODENWALDT (*Arch. f. Protistenk.* (1921), xlii, 337). [His conclusion thus agrees with that of ALEXEIEFF (1914), which has hitherto been generally accepted by protozoologists.]

ii. This paper contains a redescription of the species of *Giardia* commonly found in the rabbit and the dog, and a comparison of them with the form found in man. Material was obtained from laboratory rabbits [number not stated] and four puppies—all the latter being found infected; while, for his human material, the author apparently relied upon the figures published by SIMON (1921)—referred to above.

In the opinion of the author the three forms of Giardia studied—from rabbit, dog, and man—present slight but constant differences from one another as regards their structure and dimensions. [It may be noted that apparently only 50 individuals were measured from one rabbit, and a like number from dogs; while the measurements so obtained are contrasted with the much larger number (342) made by SIMON on the species from man.] As a result of his observations the author concludes that the three forms occurring in man, the rabbit, and the dog, represent three distinct species, which he names respectively *G. lamblia* Stiles, 1915, *G. duodenalis* Davaine, 1875, and *G. canis* sp. nov. [The possibility that *G. duodenalis* may be the same species as occurs in other rodents is not discussed; and no attempt seems to have been made to infect dogs with the rabbit's "species," or the rabbit with the dog's, or either of these hosts with the Giardia of man. In view of the author's own hypothesis (*cf.* (i) *supra*) that a species of Giardia may consist of several "heritably diverse races," which differ in their dimensions, the few measurements which he here records—unsupported by any experimental data—appear scarcely adequate to prove his conclusions, notwithstanding that they may well be, as others before him have supposed, substantially correct.]

Clifford Dobell.

i. DA CUNHA (Aristides Marques) & MUNIZ (Julio). **Parasitismo de "Trichomonas" por "Chytridacae" do genero "Sphaerita" Dangeard.**—*Brazil-Medico.* 1923. Jan. 13. Year 37. Vol. 1. No. 2. pp. 19–20.

ii. ZOTTA (G.). **Emploi de la substance cérébrale comme milieu de culture pour le** *Leptomonas pyrrhocoris.*—*C.R. Soc. Biol.* 1923. Feb. 3. Vol. 88. No. 4. pp. 281–283.

iii. ——. **Culture du** *Leptomonas pyrrhocoris* **en milieux d'organes stérilisés.**—*Ibid.* pp. 283–285.

iv. CHATTERJEE (G. C.). **A New Flagellate Parasitic in the Human Intestinal Canal.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 523–525. With 1 plate.

v. FAUST (Ernest Carroll). **Notes on** *Embadomonas sinensis*, **Faust and Wassell, 1921.**—*Jl. Parasit.* 1922. Sept. Vol. 9. No. 1. pp. 33–34. With 1 plate.

vi. LEGER (Marcel). **Formes crithidiennes observées chez** *Lyperosia thirouxi,* **Roubaud.**—*C.R. Soc. Biol.* 1922. June 17. Vol. 87. No. 22. pp. 134–136.

i. In interpreting remarkable phenomena observed in Trichomonas and other Protozoa the existence of Sphaerita parasites should not be forgotten.

ii. 100 gm. of perfectly cleaned calf-brain brayed to a broth with powdered glass is shaken up with 200 cc. of 0·75 per cent. of physiological serum, and the mixture is filtered, heated for 20 minutes to clot and precipitate gross suspensions, decanted, and distributed in tubes for use after sterilization. The slightly opalescent fluid, having a PH. index 6·9, gives rich cultures of *Leptomonas pyrrochoris* in four days.

iii. *Leptomonas pyrrochoris* also grows with great vigour in a sterilized medium of small fragments of spleen, or liver, or kidney (of calf or ox) in 0·6–0·75 per cent. physiological serum.

iv. A flagellate with eight flagella arranged in a ring, observed in a dysenteric stool. [Might possibly be a dividing form of Enteromonas ?]

v. A dozen figures of this species are here exhibited. "In general, the specific characters of *E. sinensis* agree with those of *E. intestinalis*, although differences are apparent."

vi. In a very fatal epidemic of horse-sickness at Dakar the author found in the stomach of one of 50 individuals of Lyperosia examined, numerous crithidiform flagellates active among ingested red cells like those of the horse. Whether these flagellates were proper to the fly or were a phase in the life of a parasite of the horse is left an open question.

A. A.

SENEVET (G.) & WITAS (P.). **Evolution spontanée de l'infection à** *Haemoproteus columbae*, **chez un pigeon isolé à partir du premier mois de son existence.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 787–789.

An interesting account of the behaviour of Haemoproteus in a pigeon carefully protected from any risk of reinfection.

When first taken under observation on September 27, 1920, 900 very small parasites were found in 100 fields, and the number increased more than six-fold in the course of ten days, after which they increased in size and rapidly decreased in number until on January 23, none could be found at all.

On February 4, very small parasites reappeared and increased in number (570 in 100 fields) until the 14th. Then again they began to increase in size and to diminish in number until on March 26 none could be discovered.

On August 19 the small parasites appeared again and increased in number in the course of ten days (640 in 100 fields), and then again increased in size and diminished in number until on September 5 there was none.

All this time the bird's blood was examined almost every day.

Since September 5, 1921, no parasite has been seen in examinations made twice a week up to October 5, 1922.

A. A.

LEGER (Marcel) & BÉDIER (E.). *Plasmodium* **du Lérot,** *Myoxus murinus* **Desmarest.**—*C.R. Soc. Biol.* 1922. Dec. 23. Vol. 87. No. 39. pp. 1336–1337.

Report of the discovery in the blood of a dormouse (*Myoxus murinus*), at Senegal, of an endoglobular parasite at first in forms suggestive of some sort of Piroplasmid, and afterwards in amoeboid forms, some of which exactly resemble *Plasmodium tenue.* None of the forms, however, contained any pigment. The blood of the dormouse also contained the well-known Grahamella parasite of rodents.

A. A.

LEGER (Marcel) & BÉDIER (E.). *Plasmodium* **d'un Mustélidé,** *Ictonyx zorilla,* **du Sénégal.**—*C.R. Soc. Biol.* 1923. Feb. 17. Vol. 88. No. 6. pp. 422–424. With 1 fig.

Plasmodium roubaudi, discovered by the authors in *Ictonyx zorilla,* resembles *P. malariae* in its compact and deeply pigmented protoplasm and its sluggishness, and in not affecting the size of the parasitized red-cell; it also shows some tendency to assume the "equatorial" position in the red cell.

A. A.

ANNALES DE MÉDECINE ET DE PHARMACIE COLONIALES. 1921. Jan.–Feb.–Mar. Vol. 19. No. 1. p. 116.—**Mégalosplénie et hémogrégarine en Afrique équatoriale.**

LEBOEUF reports a case of a spleen so enlarged as to give the patient —an African woman of about 35 years—the appearance of a multiparturient at term. Attacks of fever were frequent, but there was no enlargement of the liver and no cachexia. LEBOEUF compares this case with that of a Congo girl in whose spleen he found, by puncture, an organism like ROUBAUD's *Haemogregarina inexpectata.*

A. A.

NATTAN-LARRIER (L.). **Sur une hémogrégarine de l'homme (Note préliminaire).**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 943–947.

In this case, a man of 31, the infection probably originated in Equatorial Africa; but as the patient also suffered from malaria, and had a concomitant trypanosome infection as well, it is impossible to conjecture which among the many symptoms and pathological phenomena here very fully recorded are attributable to the haemogregarine discovered in his blood. The author, however, emphasizes a peculiar eruption of ill-defined rosy papules. (ROUBAUD, in an appended note, mentions rashes as having occurred in his Congo case (*H. inexpectata*), and underlines also a general mononucleosis).

The haemogregarines, which were found in abundance, more resembled *H. elliptica* Sergents & Parrot than any of the other species hitherto reported in human blood. *H. equatorialis* is the name given.

A. A.

NOC (F.). **Formes hémogrégariniennes observées dans un cas d'anémie pernicieuse autochtone.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 936–943. With 1 text fig.

Case of a man of 59 who had never been in the colonies or in contact with colonials, and had never been ill until he now came under observation for an undetermined fever that had lasted for some months. The liver and spleen were enlarged, but not the lymphatic glands. All possible causation having been exhaustively considered, the blood, which was extremely fluid and deficient in haemoglobin, was examined microscopically. The number of red cells was 1,500,000, and among them were a large number of nucleated cells of normoblast type; the number of leucocytes was about 5,000–6,000, the percentage of polymorphs being very greatly decreased and the percentage of lymphocytes enormously increased. Malaria parasites could not be detected; but a haemogregarine was found on several occasions. The first discovered was crescent shaped, with a recurved mucronate tip, and it appeared to be attached along with some blackish granules to a tattered red cell. The next discovery was a vermicular form, and then dividing forms (binary with residual mass). Further investigation was precluded by the patient's death.

The haemogregarine is compared with those previously found in man, and is adjudged to be a new species with the title *H. gallica.*

A. A.

LEGER (Marcel) & BÉDIER (E.). **Hémogrégarine du Cynocéphale; *Papio sphinx* E. Geoffroy.**—*C.R. Soc. Biol.* 1922. Oct. 14. Vol. 87. No. 29. pp. 933–934.

Description of a variety of *H. cynomolgi* Langeron found in the Senegal baboon (*Papio sphinx*).

A. A.

DOBELL (Clifford). **The Discovery of the Coccidia.**—*Parasitology.* 1922. Dec. Vol. 14. Nos. 3 & 4. pp. 342–348.

One could not profane this pious tribute to the ancestral shrine of the protozoologists by any sort of "abstract." The author, earnestly searching among the archives of the Royal Society, has already discovered for us an irresistible picture (anno 1681) of the great LEEUWENHOEK, with his homely lenses, deep in the study of *Giardia intestinalis* [see this *Bulletin,* Vol. 16, p. 89]; and now, devoting himself still to the same venerable sources, he shows us the same great serene Original (anno 1674) meditating upon the "oval corpuscles"—no other than the bodies known to future generations as oocysts of *Eimeria stiedae*—floating in the bile of a rabbit. It has been for the author a pleasant duty; and it is well done.

A. A.

CONNAL (A.). **Observations on the Pathogenicity of *Isospora hominis,* Rivolta, emend Dobell, based on a Second Case of Human Coccidiosis in Nigeria; with Remarks on the Significance of Charcot-Leyden Crystals in the Faeces.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Oct. 19. Vol. 16. No. 4. pp. 223–245.

This paper has a quite outstanding and permanent value, since it contains not only a singularly complete account of a carefully observed case of coccidial infection in man, but also a critical analysis of most if not all of the instances of the same kind of infection that have been published—not to mention the list of references to the original publications.

The case here so luminously utilized is thought to have been an exceptionally massive infection. The patient was an educated European, 40 years of age, living at the time in West Africa; the infection was the result of an accident in the laboratory.

The incubation period was 6 days; the onset of symptoms (on the seventh day) was sudden; the duration of infection (from the date of the accident to the final disappearance of oocysts) was 40 days, and cure was spontaneous, since only urgent symptoms were treated.

The signs and symptoms were diarrhoea, abdominal discomfort, flatulence, lassitude and loss of weight. The remarkable feature in the faeces, which were systematically examined, was the large amount of undigested matter, particularly fat.

Oocysts were not found in the stools, though searched for daily, until 22 days after onset of symptoms (28 days after accident of infection); they were persistent for the 9 days immediately following, could not be found on the tenth day, reappeared on the next two days, and were not found afterwards. Charcot-Leyden crystals appeared and disappeared with the oocysts.

Acute signs of illness abated within a week of the finding of oocysts. Apart from *Isospora hominis*, no cause of illness could be detected.

From his personal observations, and the investigation of recorded cases, the author concludes that although sometimes—particularly in the instance investigated, where the infection was considered to be massive—*Isospora hominis* is pathogenetic for man, it may not, and in the majority of cases probably does not, cause manifest disturbance.

A. A.

NEWHAM (H. B.) & ROBERTSON (Andrew). **A Case of** *Isospora hominis* **(Rivolta), Dobell, probably contracted in Durban, South Africa.**—*Jl. Trop. Med. & Hyg.* 1922. Nov. 1. Vol. 25. No. 21. pp. 344–345.

Two cases of infestation with *Isospora hominis* are mentioned in which infection probably took place in Portŭguese East Africa, but the case recorded is one in which infection probably occurred in South Africa. The first symptom observed was " dysentery," probably acute diarrhoea. The stool in which the oocysts were detected was soft, and contained also numerous Charcot-Leyden crystals and a few *Chilomastix mesnili*, but not any blood, mucus, pus, or Entamoebae. It is noted that in the cases of Isospora infection reported by NOC, HAUGHWOUT, and CONNAL & YOUNG, Charcot-Leyden crystals were found.

A. A.

THOMSON (J. G.) & ROBERTSON (Andrew). **A Case of Human Infection with** *Eimeria oxyspora*, **Dobell, 1919.**—*Jl. Trop. Med. & Hyg.* 1922. Dec. 1. Vol. 25. No. 23. pp. 369–371.

The patient in this case had a very heavy infection of *Giardia intestinalis*, and a history since 1918 of recurrent diarrhoea. Only a small quantity of a single stool was available for examination, and it possibly had admixtion of urine; it was dark, mostly fluid, loaded with oxalates and phosphates, and contained cysts of Giardia and oocysts of Eimeria. The authors describe the oocysts and compare them with the original descriptions of the oocysts of *E. oxyspora* and *E. snijdersi* and with the oocysts identified as *E. oxyspora* by BROUGHTON-ALCOCK & THOMSON in 1921 [see this *Bulletin*, Vol. 19, p. 468]. Finally they conclude that the discrimination of *E. snijdersi* from *E. oxyspora* rests upon a slight difference in the size of the sporocysts and on the fact that some of the sporocysts of the former species have sharper ends; differences which, in their opinion, hardly justify a specific distinction, especially when the vicissitudes undergone by the specimens distinguished as *E. snijdersi* are considered.

A. A.

GUYÉNOT (Em.), NAVILLE (A.) & PONSE (K.). **Une Larve de cestode parasitée par une microsporidie.**—*C.R. Soc. Biol.* 1922. July 22. Vol. 87. No. 27. pp. 635–637.

In snakes of the species *Tropidonotus natrix*, at Bologna, the authors frequently find, encysted in the connective-tissue, muscles, and peritoneum, the larvae of a Cestode probably appertaining to the genus Ligula. Some of these larvae are themselves parasitized by a Microsporidium, and the authors speculate on the possibility of this infection spreading to the snake.

A. A.

BODE (Paul). **Ueber das** *Balantidium coli hominis* **(Malmsten) und die bei dieser Art beobachteten Knospungsvorgänge.** [*Balantidium coli* and the Budding Process observed in this Species.]—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Jan. 30. Vol. 89. No. 7–8. pp. 285–292. With 8 text figs.

This is a long but not particularly logical argument against the identity of the Balantidium of the pig with *Balantidium coli* of man. According to the author's own observations—which are confirmatory of the recorded observations of EKECRANTZ (1869), ORTMANN (1891), and ROOS (1893)—the Balantidium of man multiplies by budding from its hinder end, whereas, according to LEUCKART and others, the Balantidium of the pig multiplies in the common Ciliate way by transverse fission. [The author's figures show a small nucleated mass protruding and finally separating from that part of the body where in the Balantidium of the frog the anus appears. The author also quotes SHEGALOW as having observed both proliferation and ordinary fission when examining Balantidium both of the pig and of man; but remarks that SHEGALOW does not mention any specific restriction of either process.]

A. A.

GHOSH (Ekendranath). **On a New Ciliate,** *Balantidium ovatum*, **sp. nov., an Intestinal Parasite in the Common Cockroach** (*Blatta americana*).—*Parasitology.* 1922. Dec. Vol. 14. Nos. 3 & 4. p. 371. With 1 text fig.

Balantidium ovatum, a new species from the intestine of *Blatta americana* (a common cockroach), is here characterized and roughly figured. It is quite distinct from *B. blattarum*. [A Balantidium was observable some years ago in common cockroaches (*Blatta orientalis*) at Belvedere, Kent.]

A. A.

LOGAN (A. H.). *Balantidium coli* **and Pernicious Anemia: Report of Four Cases.**—*Amer. Jl. Med. Sci.* Philadelphia. 1921. Nov. Vol. 162. No. 5. pp. 668–674.

This article is of a speculative type. The brief records of the four cases do not sufficiently justify the assumption that the pernicious anaemia was due to *Balantidium coli* and "its haemolytic agent."

A. A.

i. FRANCHINI (G.). **Sur une amibe particulière d'une Asclépiadacée** (*Chlorocodon Whitei*).—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 393–398. With 3 figs.
ii. ——. **Sur une amibe de la laitue** (*Lactuca sativa*).—*Ibid.* 1922. Nov. 8. Vol. 15. No. 9. pp. 784–787. With 1 text fig.
iii. ——. **Essais d'inoculation de différents protozoaires dans le latex des euphorbes.**—*Ibid.* pp. 792–795. With 2 text figs.
iv. ——. **Protozoaires de Muscides divers capturés sur des euphorbes.**—*Ibid.* 1922. Dec. 13. Vol. 15. No. 10. pp. 970–978. With 4 figs.
v. ——. **Essais d'inoculation au chat, d'amibes du latex de plantes.**—*Ibid.* pp. 931–933. With 1 text fig.
vi. ——. **Essais d'inoculation aux souris blanches du latex parasité de différentes espèces d'euphorbes.**—*Ann. Inst. Pasteur.* 1922. Dec. Vol. 36. No. 12. pp. 873–881. With 6 text figs.
vii. ——. **Action du latex d'Euphorbes sur différents trypanosomes. Culture de flagellés dans des latex divers.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 41–50.

i. The author has already described an amoeba (associated with a Crithidia) from the sap of the Asclepiad *Cryptostegia grandiflora*, and he now describes and figures another species of amoeba from another Asclepiad —*Chlorocodon whitei*—this species being associated with small trypanosomes and small oval bodies which may be developmental forms of trypanosomes.

The amoeba, which is capriciously polymorphic, can be cultivated on Nöller's medium; it has not been observed to ingest red blood cells or bacteria.

ii. Here is described, with 23 figures in the text, an amoeba found at Bologna in the sap of the lettuce, and amenable to culture on Nöller's blood-medium, from which it sometimes ingested red blood cells, though it digested them somewhat reluctantly. The author refers to the lettuce-amoeba described by MUSGRAVE & CLEGG in Manila, found on the leaves of the plant, the injection of cultures of which into three monkeys was followed by the appearance of dysentery in two of them.

iii. Having, in collaboration with LAVERAN, infected two species of Euphorbia with cultures of *Herpetomonas ctenocephali*, the author has continued his experiments in the same direction and now reports the successful infection of *Euphorbia geniculata* with cultures of *Herpetomonas muscae-domesticae* and of *Euphorbia ipecacuanha* with cultures of kala-azar of Indian origin. Attempts to infect various species of Euphorbia with cultures of Oriental sore were practically unsuccessful ("negatifs ou presque"), and of flagellates of the Pentatomid bug, *P. ornatum*, were completely unsuccessful.

iv. Many Muscids harbour parasitic protozoa—flagellates, leishmania and gregarines—and spirochaetes in their gut, and this paper relates to those found in the gut of Muscids captured on Euphorbias. The flagellates of some of these Muscids resemble those occurring in the sap of certain Euphorbias, and it is surmised that in such cases the plants may be infected from the flies' faeces, particularly as the author has succeeded in infecting Euphorbias with cultures of kala azar.

v. Three cats received rectal injections of cultures of amoebae of plant origin, in two cases from dog-banes (Apocynaceae), in one case from *Ficus carica*. In the last case there were no obvious effects; but in the first two cases the animals after respective intervals of 5 and 10 days became decidedly ill, passed blood-streaked mucosities or bloody flux, as well as amoebae with red blood cells in their protoplasm and small cyst-like forms, but recovered their health completely, the one in about 11 weeks, the other in about a month. The various amoeba-forms are figured.

vi. Of 30 mice inoculated in the peritoneum with latex of different species of Euphorbia containing trypanosomes and scanty amoebae, only seven have hitherto exhibited any parasites in the peripheral blood.

At autopsy scanty leishmaniform and flagellated parasites were found in different organs of these seven mice; in one of the seven, which was inoculated from *Exoecaria emarginata*, the parasites were free but occasionally endoglobular. Cultures (on Nöller's medium) of blood from heart, spleen, and liver of these mice have produced a large number of round and oval forms, small and large trypanosomes, etc., and also active amoebae, some of which had ingested the red blood cells of the medium.

vii. Records experiments with *Trypanosoma evansi*, *soudanense*, *brucei*, *lewisi*, and *gambiense* brought, severally, in contact with sap of various species of Euphorbia; the observed result was that these different species of Trypanosoma lived longer in contact with Euphorbia juice than in contact with physiological or with citrated solution. In every experiment the trypanosomes were added to the respective medium in their native blood.

Further experiments in the culture of Herpetomonas, Leishmania, and Trypanosoma in the sap of Euphorbias, Asclepiads, Apocynaceae, Ficus, and other plants are recorded. Some of the organisms grew well both in latex-bouillon and in pure sap; the most generally successful of all was *Herpetomonas pyrrhocoridis*, which sometimes underwent transformations never observed in its bug host, its body becoming twisted, or ovally dilated at the anterior end. *Herpetomonas ctenocephali*, on the other hand, would not grow in any of the saps attempted. Leishmania grew well enough in Euphorbia sap, some of the forms assumed by it being singularly large and round, and having several nuclei and centrosomes.

A. A.

ASHWORTH (J. H.). **On** *Rhinosporidium seeberi* **(Wernicke, 1903), with Special Reference to its Sporulation and Affinities.**—*Trans. Roy. Soc. Edinburgh.* 1923. Vol. 53. Part 2. No. 16. pp. 301–342. With 12 figs and 5 plates.

The material for this study of Rhinosporidium was supplied from an infected patient who was under the author's observation in Edinburgh for more than four years. The material, therefore, was examined both in its living state and after fixation under superlative conditions.

The patient is a young adult native of Cochin who became aware of a growth in his naso-pharynx—which impeded his swallowing and breathing and caused inconvenience by a profuse discharge of viscid mucus and occasional epistaxis—between two and three years before he went to Edinburgh, and had had the growth removed once, and once again after recurrence, while he was in India. During the eight years that he was in Edinburgh he underwent eleven operations for relief, until finally the Rouge operation was performed in hope of a radical cure. A summary of the case appeared in the *Journal of Laryngology and Otology* for 1921 and a sequel is promised for this current year.

The historical part of the study reminds us that Rhinosporidium was discovered independently in Argentina by SEEBER, who published his account of it in 1900, and in Bengal by O'KINEALY, whose material (along with that from another Indian case) was examined and described (in 1905) by MINCHIN and FANTHAM, after O'KINEALY himself had published some account of the case in 1903. SEEBER, whose discovery was forgotten until he republished it in 1912, regarded the organism as a Coccidium, though he realized that it differed from all Coccidia except *Coccidioides immitis* which has been shown to be a fungus; MINCHIN placed it in a suborder of the Haplosporidia. In the historical part is also to be found an ample record of other cases, including their locality (several places in Madras, also Ceylon, and Tennessee), and the sites infected (nasopharynx usually, but also conjunctiva, lacrimal sac, aural meatus, and penis); and also a notice of *Rhinosporidium equi* observed in 1913 by ZSCHOKKE in the nasal septum of a horse at Pretoria.

The conspicuous result of the author's own investigations is to show that the affinities of Rhinosporidium are not with the Coccidia, or with the Haplosporidia, or, as BEATTIE suggested, with the Sarcosporidia; but with the fungi of the *Phycomycetes* order (in which the thallus is formed of a single cell), and suborder *Chytridineae* (in which the mycelium is absent and the spores are usually non-sexual), and provisionally with the family *Olpidiaceae* (in which the trophic stage is spherical or subelliptical and the individual cell becomes transformed into a single sporangium).

The following brief summary of these investigations shows the groundwork of these conclusions. In its earliest stage the spherical or slightly oval Rhinosporidium is about 6 μ in diameter, has a chitinoid envelope, a much vacuolated cytoplasm, and a vesicular nucleus with all the chromatin compacted in a centrosome. Granules of protein and globules of fat accumulate in the cytoplasm until the parasite attains a diameter of 50 to 60 μ, when the first nuclear mitosis takes place, beginning as an issue from the caryosome of four coarse twisted threads. Subsequently, successive nuclear divisions occur, each succession being performed in synchrony, and when the parasite possesses about 128 nuclei and is about 100 μ in diameter its hitherto chitinous cuticle becomes greatly thickened on the inside by deposit of a substance indistinguishable from cellulose; this deposit is deficient only at one point which marks a prospective pore. Synchronous mitosis is repeated until the cytoplasm begins to divide, and when, after twelve successive divisions, about 4,000 nuclei have been formed the division of the cytoplasm is complete. Two more divisions follow, until at last the individual Rhinosporidium has been transformed into a thick-walled (cellulose) sporangium containing about 16,000 young spores, or sporoblasts. It is to be remarked that in the process of division the entire cytoplasm breaks up; there is no residual protoplasm.

To follow the development of the young spores: of these some—usually up to one-third of them—remain unchanged, or may even become smaller; but the rest—commonly, but not always, those lying about the centre of the sporangium—grow to a size of 7 to 9 μ and secrete a mucoid, superficially chitinous envelope, and their cytoplasm becomes plotted off into a mulberry of 10 to 16 refringent spherules round the vesicular nucleus; most of these spherules have, in iron-haematoxylin preparations, a dense, deeply staining centre which certainly is not a nucleus. These spherules have been mistaken by previous workers for spores, or sporules, or sporozoites; but the author notices, in an addendum to his paper, that FREY and HARTMANN had concluded that the granules, 4 to 16 in number, formed in the sporoblast of *Rhinosporidium equi* are reserve granules, not sporozoites, and that the entire sporoblast becomes a spore.

The ultimate result of these processes is a ripe sporangium stretched to a diameter of 250 to 300μ or more, containing spores and sporoblasts packed in mucoid material, and having a pore at one point through which the spores and mucoid material issue.

The spores, when discharged, lie among leucocytes beneath the host's epithelium, unchanged; they may be ingested by leucocytes, or by wear or rupture of the epithelium they may pass away in the nasal secretion; or they may be carried along the lymph channels into spaces in the connective-tissue where they have been observed to assume the trophic stage. In the transformation to the trophic stage the spore-envelope disappears and a new cell-wall is secreted apparently at the expense of the spherules, since these disappear. The young parasite is considerably smaller than the spore; it is nourished on the lymph of the connective-tissue; it grows—and the cycle is repeated.

Abnormal spores and degenerate parasites are described; among the latter, large thick-walled forms may be seen with the interior invaded by connective-tissue cells and by young healthy parasites. Or sporangia approaching ripeness may become degenerate, finishing as a bag of empty spores and mucoid matter perhaps invaded by connective-tissue cells.

The author has failed repeatedly, like previous investigators, to procure infection of laboratory animals by inoculation. Multifarious attempts to cultivate the organism have also been unsuccessful with one rather doubtful exception where the culture proved to be not pure. The author discusses, but cannot throw any light on the mode of infection.

The characters emphasized as vindicative of a fungous affiliation for Rhinosporidium are; that the trophic-stage reserves consist largely of fat; that in preparation for spore formation repeated nuclear divisions take place, and that on each occasion all the nuclei divide simultaneously; that the cytoplasm divides—and without residual protoplasm—at a late stage, and that the cells thus formed undergo only two more divisions to form spores; also the cellulose wall, the mucoid matrix, and the pore of the sporangium.

The approved name of the parasite is established as *Rhinosporidium seeberi*, the specific name *seeberi* having five years priority of *kinealyi*.

With regard to the pathological effects of the parasite, as observed in the naso-pharynx, the tumour formed has in its early stages the familiar structure of a nasal mucous polypus; in later stages it becomes firmer by hyperplasia of fibrous tissue; and later still it assumes more the character of a cystic fibroma.

A. A.

BACH (F. W.) & KIEFER (K. H.). **Untersuchungen ueber Blastocystis.** [Researches upon Blastocystis.]—*Cent. f. Bakt.* 1 Abt. Orig. 1922. Nov. 18. Vol. 89. No. 4/5. pp. 72–98. With 1 plate.

This long dissertation upon Blastocystis includes a critical survey of the literature and a detailed account of the morphology, but it does not lead to much. All the theories of the nature of Blastocystis are discussed—that it is a link between amoeba and a flagellate; the encysted form of Trichomonas; a vegetable organism; a phase in the development of a flagellate; a degeneration product of some parasite or of some epithelial cell; a Haplosporidian—but the authors only come back to the conclusion of D. D. CUNNINGHAM, the earliest observer, that the thing is an enigma. They appear to think, following KUENEN and SWELLENGREBEL, that the solution of the enigma lies in the domain of pathological anatomy. But whether Blastocystis in the human gut has any constant pathological significance is left an open question, the authors at present resting on the statement that although it is often found in a healthy intestine it is met with in greatest abundance in cases where there is intestinal derangement of some sort.

A. A.

LYNCH (Kenneth M.). **Cultivation of Blastocystis and Determination of Species.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 539–542. With 4 plates.

Here are discussed and plentifully figured *Blastocystis hominis* Brumpt, *B. gemmagina* Lynch, and *B. sporogina*, which last the author is now, in deference to KOFOID's criticism, inclined to regard as a *B. hominis* parasitized by Sphaerita or some such organism.

A. A.

BALFOUR (Andrew). [Reported by.] **Observations on Wild Rats in England, with an Account of their Ecto- and Endoparasites.**—*Parasitology.* 1922. Dec. Vol. 14. Nos. 3 & 4. pp. 282–298. With 2 plates, 1 text fig. and 2 charts.

The prime object of the Machiavellian investigations here recorded was to seek some clue to some automatic infective method, strictly and safely specific for rats, of obstructing the reproduction of those animals through the act of sexual intercourse. After a general bacterial survey attention was finally concentrated on the genital tract of female rats, four in number, showing definite local pathological changes. The organisms found in association with these changes were isolated and experimentally tested, but notwithstanding the labour involved, "nothing definite resulted." But negative results serve to clear the way for further investigations.

As a very necessary preliminary a general survey of rat-parasites was carried out. Although naturally nothing very novel was expected and little revealed, the results are worthy of record here.

1. ECTOPARASITES. On 34 black rats *Laelaps echidninus* was found in 52·9 per cent., *Haematopinus spinulosus* in 44·2, and *Xenopsylla cheopis* in 5·9. On 444 brown rats, *Laelaps echidninus* was found in 24·1 per cent., *Notoedres notoedres* in 0·2, *Haematopinus spinulosus* in 11·3, *Xenopsylla cheopis* in 3·6, *Ceratophyllus fasciatus* in 3·2, *Ctenophthalmus agyrtes* in 0·9, and *Ctenocephalus felis* vel *canis* in 0·2.

2. HELMINTHS. In the intestine of 34 black rats *Hymenolepis diminuta* was found in 17·6 per cent., *H. nana-fraterna* in 17·6, and *H. longior* Baylis (n. sp.) in 32·4, and *Oxyuris obvelata* in 3·0; also *Trichosomoides crassicauda* was found in the bladder of some of the black rats. In the intestine of 430 brown rats *Hymenolepis diminuta* was found in 28·4 per cent., *H. nana-fraterna* in 1·2, and *H. longior* Baylis in 24·9, *Heligmosomum braziliense* in 8·6, and *H. vexillatum* in 0·2, *Vaiannaia* (?) sp. in 0·7, and *Capillaria annulosa* in 0·4; also *Trichosomoides crassicanda* was found in the bladder of 48·3 per cent., and (very often) *Cysticercus fasciolaris* and (once) *Hepaticola hepatica* were found in the liver of the brown rats.

3. INTESTINAL PROTOZOA. In 32 black rats and 440 brown rats the following were found in the respective percentages: *Entamoeba muris*, 25·0 and 15·7; *Trichomonas muris*, 81·2 and 12·7; *Octomitus intestinalis*, 6·2 and 1·7, *Giardia muris*, 6·2 and 6·8; *Chilomastix bettencourti*, 18·6 and 1·8; *Eimeria falciformis*, 50·0 and 21·0.

4. HAEMATOZOA. In 34 black rats and 444 brown rats the following were found in the respective percentages: *Trypanosoma lewisi*, 38·2 and 19·0; *Hepatozoon muris*, 5·9 and 10·8; *Grahamella joyeuxi*, 0 and 0·2.

A. A.

Brown (H. C.) & Stammers (G. E. F.). With an Introductory Note by Balfour (Andrew). **Observations on Canine Faeces on London Pavements; Bacteriological, Helminthological, and Protozoological.** —*Lancet.* 1922. Dec. 2. pp. 1165–1167.

Motor traffic in cities has compelled the proverbial friend of man to seek the pavements for relief, with the result that rather odious material of doubtful salubrity gets brought into houses on boots and on children's toys. The authors of this paper have endeavoured to find out how far this material, canine ordure, is to be regarded as directly menacing to health. They have examined a considerable amount of the material, collected mainly in the regions lying between Gordon Street and Square and the northern end of Tottenham Court Road, and their verdict is as follows.

The bacterial investigation of 100 samples revealed non-lactose-fermenting bacteria in 20 cases. The effects of these bacteria were tested on mice, and the inference from the experiments is that they "are not markedly pathogenic when taken by the mouth, and, therefore, so far as this investigation goes, the presence of [dog] faeces on the pavements of cities does not appear to be a direct menace to man."

The helminthological results of the examination of 200 samples disclosed ova of the following *types* in the *percentages* severally stated: *Taenia serrata*, 2·0; *Dipylidium caninum*, 1·5; Ascaris, 3·0; Oxyuris, 0·5; Ancylostoma, 1·0; Trichocephalus, 0·5.

Examination of 200 samples for Protozoa brought to light, besides some coccidia-like bodies which did not develop under observation, cysts of the following kinds in the *percentages* severally stated: Giardia, 4·5; Isospora, 1·2; Eimeria, 1·2; *Entamoeba coli* type, 1·0; *Endolimax nana* type, 0·5; Dimastigamoeba type, 0·5.

A. A.

Bell (W. B.). **Work of the Biological Survey as it affects Disease Carriers.**—*Texas State Jl. Med.* 1923. Jan. Vol. 18. No. 9. pp. 461–465.

The principal economic work of this survey is to destroy wolves, coyotes, etc., that play havoc with live stock, and the various rodents that damage growing crops of all kinds and agricultural produce in transit and store. In the year 1920–21 nineteen million acres of land were treated with poisoned bait for rodents, and in eight months of the following year 176,703 larger carnivora were killed; the survey also co-operated in State campaigns against house-rats. Incidentally, of course, much assistance was rendered to the conservation of the public health.

A. A.

Nöller. **Die Bekämpfung der hygienisch wichtigen tierischen Schädlinge.** [The Control of Hygienically Important Animal Pests.]—*Cent. f. Bakt.* 1 Abt. Orig. 1922. Oct. 24. Vol. 89. No. 1–3. pp. 37–65.

This paper, which contains nothing new, deals with only one aspect of the control of animal pests of hygienic import, namely, methods of destroying them by poisons. The line of impact of the poison—whether through skin, or breathing machinery, or stomach—and the medium of application—ointment, liniment, lotion, wash, emulsion—are first discussed, and then the particular application to particular kinds of pests. The pests themselves are catalogued as (1) non-parasitic carriers of disease and of parasites, such as rats and house-flies; (2) temporary ectoparasites, such as ticks, bird-mites, fleas, bugs, and certain bloodsucking flies; and (3) fixed ectoparasites, such as itch mites, lice, bird-lice, and tick-flies.

A. A.

LANGERON (Maurice) & DU NOYER (Rondeau). **Coprologie microscopique.**—Reprinted from *Bull. Sci. Pharmacol.* 1922. Mar.–May. Nos. 3–5. 33 pp. With 12 figs.

Ample and excellent instructions for the examination of fresh faeces, followed by plentifully illustrated descriptions of the common ingredients of the faex and of the vegetable and animal trespassers—all in 33 pages. One would very much like to have an English version of this useful compendium.

A. A.

PAWLOWSKY (E.). **Au sujet de pseudo-parasites.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 825–826.

One of the impressive performances of the Oriental quack is to discover a maggot in some aching organ of his patient and to extract it by his conjury. The author of the present paper finds that some larvae " extracted " by Chinese " dentists " from aching teeth are Cecidomyidae (gall gnats), which certainly would fit the part [see this *Bulletin*, Vol. 13, p. 55].

A. A.

FACULTÉ DE MÉDECINE DE PARIS. **Enseignement complémentaire de la parasitologie appliquée au diagnostic à l'hygiène et l'épidémiologie.** 24 pp. 1922. Paris: Masson & Cie, Éditeurs, 120, Boulevard Saint-Germain.

Conspectus and syllabus of the courses of instruction provided at the Laboratory of Parasitology under the direction of Professor BRUMPT, in Paris. The laboratory is situated at 15 Rue de l'Ecole de Médecine, and its staff includes MM. JOYEUX, NEVEU-LEMAIRE, LANGERON, LARROUSSE, and LAVIER; its collections include those particularly associated with the names of DAVAINE, LABOULBÈNE, MÉGNIN, BLANCHARD, and BRUMPT, and it possesses a considerable library, which receives regular accessions of current periodicals from many parts of the world. Apart from the vacation course of ten meetings, the course of instruction, which is entirely practical, includes Laboratory Technique, Protozoology, Helminthology, Medical Entomology, and Mycology, ten meetings being allotted to each of these subjects.

A. A.

MACFIE (J. W. S.) & INGRAM (A.). **Certain Nurseries of Insect Life in West Africa.**—*Bull. Entom. Res.* 1923. Jan. Vol. 13. Pt. 3. pp. 291–294.

This valuable paper gives an account of the specific insects (mainly Diptera) that the authors have bred from miscellaneous damp material collected from rot-holes, bamboo-stools, decaying logs, old canoes, rotting fibre from base of banana trees, edges of pools and puddles, crab-holes, etc. The banana fibre was particularly prolific, and, next, the debris of rot-holes and the rotting wood scraped from old canoes lying afloat.

The total number of species of midges bred out makes quite a long list, and includes *Anopheles costalis* and 10 other species of Culicidae, among them " *Stegomyia fasciata*."

Mention is also made of a particular rot-hole in a *Poinciana regia* tree, kept under continuous observation by these indefatigable authors, from which all the six species of Stegomyia known to occur in Accra have issued.

Another most interesting item is a list of the Diptera locally associated with *Pistia stratiotes*—the " water-lettuce " or " water brussels-sprout," of circumtropical range in swamps. The local list includes 18 species of Culicidae, among them such formidable species as *Anopheles costalis, funestus,* and *pharoensis,* and also *A. marshalli, mauritianus,* and *nili.*

A. A.

SHANNON (R. C.). **The Use of Nutrient Agar for rearing Dipterous Larvae.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 555–557.

Having learned of LUTZ's method of rearing larvae of Tabanidae in nice transparent agar instead of their native inconvenient mud, the author thought that beef-extract agar, which the larvae could eat, would be better still. He now, after trial, recommends this transparently clean, neat method, by which all the doings of the larva can be watched, and its cast skins immediately detected and secured. The bacteria and fungi that may sometimes contaminate the surface of the medium have not been found inconvenient to the observer, or harmful to larvae. As the writer points out, this method has numerous promising applications.

" Dehydrated Bacto-Nutrient Agar,"* which has only to be mixed with the desired amount of water and boiled, to be ready for use, is recommended as very convenient.

A. A.

HACKER (H. P.). **Malaria Bureau Annual Report, 1921.**—*Federated Malay States Med. Report for the Year 1921.* pp. 10–20.

Dr. LAMBORN's work, which suggested that seasonal periods in the development of the alga-flora might give rise to a seasonal prevalence of specific Anopheles, has been continued.

Anopheles vagus and *aconitus* have been observed to lay fertile eggs throughout the year. For other local species the impression is that they also have no definite breeding season, but will breed when and where the natural conditions are suitable. What these conditions may be has to be discovered.

Under certain circumstances, still undiscovered, the larva stage of *A. aconitus* may be prolonged to 163 days. The larvae of *A. leucosphyrus,* particularly in abnormal breeding-places, have a tendency to vary; for this reason *A. watsoni,* the recently discovered larva of which shows no perfectly constant difference from that of *A. leucosphyrus*, may possibly be, as STANTON conjectured, a variety of the latter species. The larvae of *A. aitkeni* also show variations. The larvae of several species of Anopheles that are commonly bred in pools, and even in large pools, have been found in disused utensils, etc., about habitations.

---

* Supplied by Digestive Ferments Company, Detroit, Michigan.

An outbreak of house-flies, identified as *Musca domestica*, was traced to an origin in cow-dung.

A series of appendices give the tabulated results of an immense amount of methodical work on the catches of specific Anopheles, both adults and larvae, in particular localities, month by month, throughout the year.

A. A.

WATSON (Malcolm). **The Control of Some Species of Anopheles with Special Reference to Biological Methods.**—*Trans. 4th Congress of the Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 435–440.

Watson came to the conclusion some years ago that the existence of a given species of Anopheles larvae in a given habitat is largely due to the composition of the water there, and that by investigating the factors that contribute to the aquatic economy of the given species it might be possible to control the species by modifying or " polluting " the water. He here, in the light of more extensive experience, commends this proposition as worthy of still further study.

A. A.

ROOT (Francis Metcalf). **The Larvae of American Anopheles Mosquitoes, in Relation to Classification and Identification.**—*Amer. Jl Hyg.* Baltimore. 1922. July. Vol. 2. No. 4. pp. 379–393. With 3 text figs. & 2 plates.

The author has made a comprehensive and detailed study of the larvae of the American species of Anopheles, and has produced the following key for their identification :—

" For the convenience of field workers, I include here a key to the identification of the mature larvae of American *Anopheles* as far as they are known. As can be readily seen, much remains to be done in completing such a key. The characters at present known only serve to designate whole groups of species in many instances. I have included statements as to the position of the palmate hairs, though in the light of what I have already stated in regard to their use, they should not be relied upon absolutely. The form of these statements can be readily understood, I think. For example, the statement ' Palmate hairs on Th, 1–7 ' means that they are present on the thorax and the first to seventh abdominal segments.

Key to the Known Larvae of American Anopheles Mosquitoes.

1. " Outer anterior clypeal hair unbranched 2
" Outer anterior clypeal hair dichotomously branched 5
" Outer anterior clypeal hair split up like a fan at tip—
A. fajardoi—Palmate hairs on 3–5.
" Outer anterior clypeal hairs with fine lateral branches—
A. albimanus—Palmate hairs on Th, 1–7 or on 1–7.
A. tarsimaculatus—Palmate hairs on 1–7.
A. argyritarsis—Palmate hairs on Th, 1–7 or on 2–7.
2. " Lateral hairs of abdominal segments 4 to 6 feathered 3
" Lateral hairs of abdominal segments 4 to 6 not feathered .. 4

3. " Frontal hairs very short and unbranched—
A. barberi—Palmate hairs on 3–6.
" Frontal hairs of normal length, some of them unbranched—
A. cruzi—Palmate hairs on 1–7, leaflets sharp pointed.
A. neivai—Palmate hairs on 2–7, leaflets truncate at tip.
4. " Leaflets of palmate hairs slender, smooth, not notched—
A. lutzi—Palmate hairs on 1–7.
A. parvus—Palmate hairs on 1–7.
" Leaflets of palmate hairs lanceolate, notched near tip—
A. eiseni—Palmate hairs on 2–7.
" Leaflets of palmate hairs approaching terminal filament type—
A. pseudopunctipennis—Palmate hairs on 3–7.
5. " Outer anterior clypeal hair with more than twenty ultimate branchlets 6
" Outer anterior clypeal hair with less than ten ultimate branchlets—
A. punctimacula—Palmate hairs on 3–7.
A. strigimacula—Palmate hairs on 3–7.
A. apicimacula—Palmate hairs on 3–7.
6. " Inner anterior clypeal hair with fine lateral branches—
A. grabhamii—Palmate hairs on 3–7.
" Inner anterior clypeal hairs unbranched—
A. punctipennis—Palmate hairs on 2–7.
A. quadrimaculatus—Palmate hairs on 2–7.
A. crucians—Palmate hairs on 3–7, first and last pairs small.
A. occidentalis—Palmate hairs on 3–7, all about same size."

A. A.

i. Schüffner. **Bericht ueber die Assanierung von Sibolga.** [Report on the Sanitation of Sibolga.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 431–434.
ii. Swellengrebel (N. H.). **De theorie van Roubaud in Holland.** [Roubaud's Theory in Holland.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 8. pp. 856–862. With 1 map.
iii. Schueffner (W.). **Mückenfang und Ableitung der Malariamucken auf Tiere.**—*Ibid.* pp. 457–468. With 1 plate.
iv. Neiva (Arthur) & Pinto (Cesar). **Contribuição para o conhecimento das anophelinas do estado de Matto Grosso com a descripção de uma nova especie.**—*Brazil Medico.* 1922. Nov. 18. Year 36. Vol. 2. No. 46. pp. 321–322.
v. —— & ——. **Considerações sobre o Genero** " *Cellia* " **Theobald, com a descripção de uma nova especie.**—*Ibid.* Dec. 2. No. 48. pp. 355–357. With 4 text figs.

i. Sibolga, on the west coast of Sumatra, about the latitude of Singapore, lies at the mouth of a stream which forms brackish lagoons very favourable to the breeding of the dangerous *Anopheles ludlowi*. *A. maculatus*, so dangerous in the Malay States, is not formidable at Sibolga.

ii. Roubaud's theory was dealt with in this *Bulletin* (Vol. 16, p. 103, and Vol. 19, pp. 476–480). Swellengrebel compares the number of cattle with the prevalence of malaria in different parts of North Holland. He is convinced that cattle may attract the mosquitoes and accordingly diminish the danger offered by their bites, but he thinks it unproved and improbable that this is the only explanation of local immunity against malaria in certain regions. On the contrary the presence of cattle may lead to increase of the number of Anophelines in human dwellings. Roubaud does not take into account influences like cessation of the production of eggs and stabilization of the mosquitoes in the houses in winter time, resulting in elimination of the influence of cattle. If zootropic races of Anopheles exist at all, such cannot be the result of hereditary fixation of their preference for cattle.

iii. General remarks on the subject of destruction, etc., of mosquitoes in houses, etc., and by diverting them to cattle; prefaced by some remarks on what the author considers to have been an illustration of the prophylactic value of quinine among some school children in a bad epidemic of malignant tertian malaria.

iv. Among the Anopheles collected by Pinto in the State of Matto Grosso (Brazil) are three specimens of a new species, *Cellia rondoni,* here fully described.

v. *Cellia triannulata* described as a new species approximate to *C. rondoni* of these authors.

A. A.

i. YOUNG (C. J.). **Notes on the Bionomics of** *Stegomyia calopus,* **Meigen, in Brazil. Part I.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 389–406.

ii. GORDON (R. M.). **Notes on the Bionomics of** *Stegomyia calopus,* **Meigen, in Brazil. Part II.**—*Ibid.* pp. 425–439. With 2 figs.

There is nothing very novel or unexpected in these miscellaneous observations.

i. More eggs were observed to be laid on a damp surface than on water, and more on foul water than on clean. Of eggs kept *in water* some hatched after five months, but none after seven months. The duration of the larva stage varied from 4–42 days, and of the pupa stage from 1–3 days. Pupae of at least 24 hours gave issue to adults although kept dry. No eggs were produced on a diet of peptone and sugar. In these observations the males that hatched out very much exceeded the females in number.

ii. In the course of 15 months' search about Manaos *Stegomyia fasciata* larvae were never found except in "domestic" waters. Their absence from natural waters is not due to any aversion of the female to deposit eggs, or to any inability of larvae to grow, in such waters, but appears to be due to the activity of natural enemies. In the earliest adult hatchings from the issue of mixed batches of eggs males preponderated [a phenomenon of common observation not only with Stegomyia but with many other Arthropods]. Eggs [as usual] were not produced on any diet but blood. The insect will bite corpses even 18 hours after death. *Stegomyia fasciata* larvae observed in jars of water in a ship that left Para in February had given issue to living adults at Havre 16 days afterwards and at Liverpool 20 days afterwards.

A. A.

MONROE (W. M.). **Notes on the Limit of the Usefulness of Fish in Larvae** (*Aëdes calopus*) **Control.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 21–26.

For service against *Stegomyia fasciata* larvae in cisterns and barrels bottom-feeding fish are rather more efficient than top-feeders. Usually a single fish, preferably a male, is employed for a cistern and a pair for a barrel. An average consumption of larvae is about 150 a day. In one or two per cent of barrels fish and larvae may be found living happily together, but this is only because the supply of larvae exceeds the fishes' demand.

A. A.

DUNN (Lawrence H.). **Prevalence of the Yellow Fever Mosquito,** *Aëdes calopus,* **in the Southern Part of Peru.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 1–8.

The survey included the principal ports and coastal-plain towns in the southern half of Peru. Two thousand two hundred and seventy houses were visited and *Aëdes calopus* (= *Stegomyia fasciata*) was breeding in more than 43 per cent. of them.

A. A.

i. PORTO RICO AGRICULTURAL EXPERIMENT STATION. **Circular No. 20. Mosquito Survey of Mayaguez.**

ii. LEGENDRE (J.). **Rôle trophique des oiseaux à l'égard des culicines.**—*C.R. Acad. Sci.* 1922. Oct. 16. Vol. 175. No. 16. pp. 646–648.

iii. BARRAUD (P. J.). **A Revision of the Culicine Mosquitoes of India. Part I.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 772–788. With 17 plates.

i. The species identified were *Anopheles albimanus* (6·5 per cent.), "*Aedes aegypti*" (alias *Stegomyia fasciata*) (65·5 per cent.), and *Culex quinquefasciatus* (= *C. fatigans*) (24·5 per cent.).

ii. The author, in continuation of his studies of the same kind made in other places, finds that at Beyrout *Culex pipiens* feeds mainly on the common sparrow, though it also haunts rabbit-hutches and fowl-houses. The author thinks highly of the relief and protection thus given to man by humble creatures like sparrows.

iii. This instalment, which is profusely illustrated, deals with the Indian species of Stegomyia. Two Stegomyia-like species having, among other differentiae, the palpi alike in length (about one-third that of the proboscis) in both sexes, are separated as a new genus, *Christophersiomyia*.

A. A.

PRINGAULT (E.). **Etude sur la toxicité des vapeurs de quelques substances chimiques sur les Phlébotomes.**—*C.R. Soc. Biol.* 1922. July–Sept. Vol. 87. No. 28. pp. 846–848.

The vapours of the following substances in the severally stated proportions per cubic metre of space were observed to be fatal to *Phlebotomus perniciosus* in the respective times stated :—Sulphur, 50 gm. in 30 seconds or more ; 0·02 per cent. HCN in 5 seconds ; methyl or ethyl alcohol, 125 gm. in 10 minutes ; formaldehyde, 50 gm. in about 5 minutes ; pyridine, 5 gm. in about a minute ; nicotine, about 5 gm. in 20 seconds ; cresyl, 1 gm. in 10 minutes. Vaporization of 100 gm. sulphuric ether or chloroform was not fatal after 15 minutes contact. Vapour of cresyl seems to the author to be the best for practical purposes.

A. A.

i. PARROT (L.). **Présence de** *Phlebotomus perniciosus* **Newstead dans la région parisienne.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. p. 694.

ii. INGRAM (A.) & MACFIE (J. W. S.). **West African Ceratopogoninae. Part II.**—*Ann. Trop. Med. & Parasit.* 1922. Oct. 18. Vol. 16. No. 3. pp. 243–282. With 24 figs.

iii. —— & ——. **A Note on the Prevalence of Ceratopogonine Midges on the Windows of the Accra Laboratory during a Completed Year.**—*Ann. Trop. Med. & Parasit.* 1922. Oct. 18. Vol. 16. No. 3. pp. 301–304.

iv. SENIOR-WHITE (Ronald). **A Note on Pseudo-Tracheal Teeth in the "Eye-Fly"** (*Siphunculina funicola,* **de Meijère).**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 825–826. With 1 plate.

i. Parrot reports Phlebotomus in the outskirts of Paris, and a correspondent of MARCHOUX writes of being assailed by a swarm of Phlebotomus in Charente.

ii. In this second instalment of a valuable paper 16 species, of which 13 are new to science, are fully described with, in most cases, some apposite figures.

iii. In the course of 12 months' systematic daily observation between three and four thousand individual Ceratopogoninae and Phlebotomus were captured on the windows of the author's laboratory at Accra.

iv. [Not a few Muscoid flies have the pseudotracheal channels reduced in number and in part offensively modified] and attention is here drawn to the " eye-fly " (*Siphunculina funicola*) where the free ends of some of the pseudo-tracheal rings are produced to form long spinules.

A. A.

JOHNSTON (T. Harvey). **Some Facts regarding the Biology of the House Fly.**—*Med. Jl. Australia.* 1922. Oct. 28. 9th Year. Vol. 2. No. 18. pp. 494–499.

After commenting on the paucity of published observations of the life-history of the common house-fly (*Musca domestica*) in Australia, the author gives in preliminary detail some observations made by Mr. O. W. TIEGS and himself in Brisbane in 1919–21, of which the following is a sufficient summary for the present.

In Brisbane the house-fly can pass through all its stages from egg to adult in 7–8 days in midsummer, 11–15 days in autumn, and 12–16 days in winter. Pairing occurred in 4–8 days after eclosion, eggs being laid 4 days afterwards. From these facts the obvious inference is drawn that in Brisbane a weekly collection of house-refuse and night-soil does not preclude the possibility of flies proceeding so far in their development in appropriate household receptacles as to escape immediate destruction.

The author and his associate have also made some careful observations of the life-history of *Sarcophaga* spp. in Brisbane. The term from birth of larva to eclosion of adult may be 12–18 days in summer and 10–12 weeks as cold weather advances. Pairing usually occurs in 2–3 (sometimes as many as 8) days after eclosion, and the bringing-forth of larvae begins about 8 days afterwards. When the larva is full grown (3–6 days in summer, 7 days during winter) a pre-pupal stage intervenes—of 2–3 days duration in summer and 7–8 days in winter and spring—during which the larva, though not feeding, wanders away, with considerable facility in climbing, in search of a suitable site for pupation.

The paper is valuable equally for biological and historic detail.

A. A.

HARRISON (Launcelot). **Flies and Infectious Disease.**—*Med. Jl. Australia.* 1922. Oct. 28. 9th Year. Vol. 2. No. 18. pp. 489–494.

There is nothing new in this paper, the prologue of which contains some unpardonably loose statements—as that Sir Patrick Manson " suggested as long ago as 1879 that microfilariae might be transmitted by blood-sucking insects, such as mosquitoes, but the matter was not proved at that date," and " Bruce, in 1893, elucidated the part played by tsetse flies in the transmission of sleeping sickness."

A. A.

DUNN (L. H.). **Observations on the Oviposition of the House-Fly, *Musca domestica*, L., in Panama.**—*Bull. Entom. Res.* 1923. Jan. Vol. 13. Pt. 3. pp. 301–305.

After reviewing work of other observers, the author describes in detail, and tabulates, his own observations which were made on isolated couples of *Musca domestica*, and were conducted throughout with the most scrupulous regard to the sanitary well-being of the insects. The author's conclusions are: That pairing may occur within 24 hours from emergence. That one successful pairing seems to endow the female with fertility for life. That oviposition may begin as early as 2¼ days after emergence. That as many as 159 eggs may be laid in one batch. That large batches are sometimes laid at intervals of but 36 hours. That one female may produce as many as 21 batches—a total of 2,387 eggs—in the course of 31 days.

A. A.

WOLLMAN (E.). **Biologie de la mouche domestique et des larves de mouches à viande, en élevages aseptiques.**—*Ann. Inst. Pasteur.* 1922. Nov. Vol. 36. No. 11. pp. 784–788.

Of some new-emerged aseptic house-flies fed on sterilized milk and kept at a temperature of 24°–26° C., three lived 26–31 days in August–September, one lived 61 days in October–December, and one lived 62 days in March–May. Under aseptic management the interval between one adult generation and another was 23–24 days. Larvae can develop quite well in the absence of microbes. The author verified FABRE's statement that the larvae dissolve their pabulum by the emission of their own secretions into it. A. A.

ROUBAUD (E.) & VEILLON (R.). **Recherches sur l'attraction des mouches communes par les substances de fermentation et de putréfaction.**—*Ann. Inst. Pasteur.* 1922. Nov. Vol. 36. No. 11. pp. 752–764.

To eyes in which the all-pervading mysteries of living nature are reflected as tropisms and tropical reactions, this paper will be interesting: it deals with the chemotropic responses of flies. When flies of either sex are hungry they react to chemotropisms of one sort; when female flies are heavy with ripe eggs they react to chemotropisms of another sort.

The details of eight experimental observations made in the open air in five midsummer days are recorded, among other things, in this paper. They showed extract of yeast and macerated fish to be feebly attractive to hungry flies, and macerated pears to be very highly attractive; meat two and three and four days old was more attractive than putrescent meat; cooked potatoes also were attractive. The blowfly, *Calliphora erythrocephala*, was observed to be more attracted by the potato than by the meat, and Anthomyid flies to be more attracted by meat than by vegetable matter. But in all these experiments in the open air the house-fly, *Musca domestica*, appeared to take little interest; only 15 were caught altogether.

To female flies having ripe eggs to deposit, CO_2 and acetic acid provide the necessary stimulus. A certain elevation of temperature and atmospheric moisture are also necessary, these conditions, as the authors suggest, operating as a sort of warm bath to facilitate delivery of the eggs. A. A.

RICHARDSON (Charles H.) & RICHARDSON (Eva H.). **Is the House-Fly in its Natural Environment attracted to Carbon Dioxide ?**—*Jl. Econ. Ent.* 1922. Dec. Vol. 15. No. 6. pp. 425–430.

C. H. Richardson, in 1916, reported, as the result of adequate experiment, that the female house-fly (*Musca domestica*) is attracted by the ammonia emitted from fermenting organic matter Later, CRUMB and LYON concluded that it is not the ammonia but the CO_2 emanating from decomposing organic matter that attracts the parturient house-fly. The Richardsons now give full details of experiments which confirm the conclusion that ammonia attracts the parturient house-fly and contradict the conclusions of CRUMB and LYON. The experiments were carried out in the open air, close to a dwelling-house, and sterilized bran, moistened with distilled water, was used throughout as the indifferent excipient for the pure chemical material from which the requisite gases were disengaged.

A. A.

ROUBAUD (E.). **Recherches sur la fécondité et la longévité de la mouche domestique.**—*Ann. Inst. Pasteur.* 1922. Nov. Vol. 36. No. 11. pp. 765–783. With 1 fig.

The longevity of the house-fly is very difficult to estimate. A longevity of 11–16 weeks attributed to this insect by some authors can be possible only under abnormal conditions of reproductive inertia ; under normal conditions of sexual and summer activity the term of life must be much less—according to HEWITT's estimate, about two months.

Quite apart from temperature the fecundity of the house-fly is influenced by various conditions. House-flies fed solely on sugar will not produce eggs ; there must be nitrogen in their food. Horse-dung, so attractive for oviposition, is not by itself a fertile diet, though human excrement is. Empusa infection does not necessarily cause sterility.

In a briskly-fermenting dung-hill, in summer, the development of the house-fly from egg to adult takes six to nine days. As at a temperature of 68° F. the adult will begin to deposit eggs six days after emergence, the compass of a summer-generation on a suitable dung-heap may be calculated as 12–15 days—from one generation to another. If, as is certain, a single female house-fly may bring forth more than 600 eggs in the course of her existence, and if we allow, say, 18 days (instead of 12–15) from one generation to another, then in computing on September 30 the possible descendants of a house-fly hatched on May 1 the result is perfectly stupendous.

A. A.

ONORATO (Raffaele). **Le miasi in Tripolitania.**—*Arch. Ital. di Sci. Med. Coloniali.* Tripoli. 1922. Jan.–Feb. ; Mar.–Apr. ; May ; June ; July ; Aug. ; Sept. ; Oct. ; Nov. ; & Dec. Vol. 3. Nos. 1–2 ; 3–4 ; 5 ; 6 ; 7 ; 8 ; 9 ; 10 ; 11 ; & 12. pp. 14–29 ; 33–45 ; 69–88 ; 101–117 ; 155–162 ; 188–193 ; 216–227 ; 229–259 ; 261–283. With 28 figs. ; & 293–315. With 16 figs.

Although this series of papers contains nothing new or unfamiliar, it constitutes a very useful local and seasonal record—having also a general interest—of myiasis in man. Eighty-five cases of " secondary" and 16 of "primary" myiasis are considered in detail—secondary myiasis referring to cases where maggots have obtained a lodging in existent lesions of various kinds; primary myiasis referring to cases where maggots alone are responsible for lesions or disturbances in various organs and regions of the body. Not all the species have been identified, but the following is the list of those that have been: *Wohlfartia magnifica, Sarcophaga haemorrhoidalis* and *S. beckeri,* Cynomyia sp., *Musca domestica, Calliphora erythrocephala* and *C. vomitoria, Lucilia serricata* and *L. caesar,* Pycnosoma sp., *Stomoxys calcitrans, Philaematomyia insignis, Mintho praeceps,* Phormia sp., *Fannia canicularis, Oestrus ovis,* and *Hypoderma bovis.* The species are described and figured in 18 plates and there is a useful bibliography.

A. A.

GANDER (G.). **Un cas de myase sous-cutanée.**—*Rev. Méd. de la Suisse Romande.* 1922. Sept. Vol. 42. No. 9. pp. 597–600.

A case of myiasis in a little girl of four years. She had been ill for more than three months, first with fever and abdominal pains, then with pains in the thorax, finally with headache and vomiting, leading up to an epileptiform fit. Meningitis was suspected.

For two days after the author's visit the child was better, but on the fourth day she became delirious and convulsed, and on the next day the temperature was 104° F., there was twitching of the hands, and the eyelids were oedematous. Then the mother said that "something had come out during the night," and the author, investigating the scalp, found in the parietal region a little crater containing something that squirmed. This proved to be an Oestrid larva [probably Hypoderma]. After the removal of the larva and a sleep that lasted nearly 24 hours the little patient rapidly recovered.

A. A.

STANCANELLI (Pietro). **Myiasis muscosa (da** *Sarcophaga magnifica* **Schiner) su tigna favosa.** [Myiasis (Larvae of *Sarcophaga magnifica*) developing in Favus.]—*Policlinico.* Sez. Prat. 1922. Oct. 16. Vol. 29. No. 42. pp. 1357–1359.

A report of a case of a man, 19 years of age, who had suffered from Favus since childhood. A slight injury allowed the development of the maggots, which were lodged in enormous numbers in a cavity the size of a large turkey's egg over the occipital region. The patient was accustomed to sleep in the open.

H. Harold Scott.

MARTINEZ (Ezequiel A.). **Reacciones biológicas encontradas en un sujeto afecto de miasis nasal producida por la** *Chrysomya macellaria.* [Biological Reactions in a Patient suffering from Nasal Myiasis due to *Chrysomyia macellaria.*]—*Crónica Méd.* Lima. 1922. Aug. Vol. 39. No. 710. pp. 294–296.

A negro, 18 years of age, on rising from bed was seized with violent sneezing and catarrhal symptoms. During the ensuing three days there was general malaise with pain in the left frontal region and profuse blood-stained discharge from the left nostril. Numerous adult larvae of *Chrysomyia macellaria* were discovered and expelled. Other symptoms noted were: A rise of temperature between 38·2° and 39° C. for three days after expulsion of the larvae; the presence in the sputum of staphylococci and streptococci, micrococcus catarrhalis and Pfeiffer's bacillus. Blood examination revealed erythrocytes 4,120,000, leucccytes 12,000 per cmm., eosinophiles 12 per cent. A week later erythrocytes were 3,660,000, leucocytes 9,000, eosinophiles 0. The Wassermann reaction was "frankly positive, but, without any specific treatment, became negative eight days later."

All these changes are ascribed to the presence of the larvae which had caused no discomfort during the time of their development.

H. Harold Scott.

---

i. Desoil (P.) & Delhaye (R.). **Contribution à la pathogénie des myases intestinales par l'étude de la résistance des oeufs et larves de Calliphorées aux agents physiques et chimiques intervenant dans le tube digestif.**—*C. R. Soc. Biol.* 1922. Nov. 18. Vol. 87. No. 34. pp. 1098–1100.

ii. —— & ——. **Essais d'infestation expérimentale du tube digestif par oeufs et larves de** *Calliphora vomitoria.*—*Ibid.* Dec. 16. No. 38. pp. 1303–1305.

i. This paper, dealing with intestinal myiasis from the standpoint of larvae not specially adapted to an endoparasitic existence, contains details of well-varied experiments with eggs and maggots of the common blowfly exposed *in vitro* to conditions corresponding with those to be met with in the active human stomach.

The proximate conclusions are that both eggs and quite intact larvae can withstand for a time the most potent biochemical hostilities of the human stomach as counterfeited in vitro.

The ultimate conclusions are that blowfly eggs swallowed in food could no doubt pass unhurt through the human stomach, especially with the assistance of liquid refreshment; but that with blowfly larvae other things than the biochemistry of the stomach have to be considered, namely, mechanical injury from the intrinsic movements of the organ (for the larvae are very vulnerable), and privation of air by mechanical obstruction of the spiracles.

ii. Eggs of blowfly (*Calliphora vomitoria*) are not injured at all in the alimentary canal of the frog, but are digested by birds, the dog, and usually, but not in every case, by the guinea-pig. Maggots are damaged but not always killed in passage through the frog, are quickly killed in the crop of the pigeon and fowl (though on one occasion two maggots were found still living in the intestine three hours after ingestion), and though they may offer a temporary resistance in the stomach of mammals (guinea-pig, rabbit and dog) are ultimately killed by the gastric juice and found dead either in the stomach or the intestine. Young maggots can easily creep into the rectum through the anus.

A. A.

i. PAWLOWSKY (E N.) & STEIN (A. R.). **Nouveau cas de** *Creeping Disease* (*Myasis linearis*) **en Russie.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 555–558.

ii. VILLARD (H.). **Deux cas de Myase oculaire.**—*Ann. d'Oculistique.* 1922. Sept. Year 85. Vol. 159. No. 9. pp. 670–671.

iii. WALKER (E. M.). **Some Cases of Cutaneous Myiasis, with Notes on the Larvae of** *Wohlfahrtia vigil* **(Walker).**—*Jl. Parasit.* 1922. Sept. Vol. 9. No. 1. pp. 1–5. With 3 plates.

i. The larva in this case was identified as a *Gastrophilus*, and is said to have been burrowing in the skin for more than five months. The paper is occupied with an account of the microscopic effects upon the epidermal cells.

ii. Two cases observed at Montpellier, one in a child of three years, in which young larvae of flies of some kind were lodged in the conjunctiva.

iii. Three cases of cutaneous myiasis, caused by *Wohlfartia vigil*, in infants in Canada; and a fourth case caused by numerous larvae of some species of fly not determined. Certain structures of the former larvae are figured.

A. A.

ROUBAUD (E.). **Les mouches tsétsés en Afrique Occidentale Française.**—*Bull. Comité d'Etudes Historiques et Scientifiques de l'Afrique Occidentale Française.* 1920. July–Sept. No. 4. pp. 257–300. With map.

This is a perspicacious account of the tsetse flies of French West Africa—their structural features, biology, and distinctive specific characters; their distribution and habitat; their seasonal migrations; their local relations (through influence upon humidity and vegetation) with geology, topography and soil; and the subject of their control. Various problems of trypanosomiasis are also discussed, such as differences in the susceptibility of different domestic animals, protective influence of animals, particularly resistant breeds of cattle, for man, and local differences in the infectivity of tsetse flies.

According to the author two-thirds of the area of French West Africa is infested with Glossina, the insect's range being limited to 14° N. lat., except in some specially favourable spots on the banks of the Niger as far as 16° N., where *G. medicorum* occurs. Of the nine species appertaining to the French territories only four, namely, *palpalis*, *tachinoides*, *morsitans*, and *longipalpis*, are dealt with as being of importance, and of these four only *G. palpalis* tends to accommodate itself to the vicinity of man. *G. morsitans* is described as a typically wild fly never found in populous tracts and having no propensity for man.

In considering problems of trypanosomiasis the particular susceptibility of the humped Indian cattle, and the remarkable insusceptibility of the little N'dama cattle and of the dwarf Fouta goat are mentioned. With regard to human trypanosomiasis, the author observes that the most dangerous localities are those where *G. palpalis* is least abundant, these, for the fly, being areas of deficient food-supply, where, consequently, man is most likely to be attacked.

The author discusses the wonderful localization of trypanosome diseases, and the want of any parallelism between the distribution of the different viruses and that of their specific tsetse flies; this he can explain only on the theory that different strains of flies must differ in susceptibility to infection.

The control of Glossina is admitted to be a difficult subject. The author appears to think that diffusion of knowledge of all the facts about tsetse flies and their doings, particularly its diffusion in schools, must perforce do good. For *G. morsitans* he advises pushing the big game into the background; for "hygrophile" species clearing and destruction of coverts, and for *G. palpalis* in particular the stalling of cattle—preferably cattle of resistant breed—as a counter-attractive screen to villages. Looking for breeding-grounds to destroy is arduous work and the practical results can only be mere crumbs.

A. A.

ROUBAUD (E.). **Les mouches tsétsés dans l'Ouest-Africain: Distribution géographique; Histoire; Rôle pathogène.**—*Ann. Inst. Pasteur.* 1922. Oct. Vol. 36. No. 10. pp. 720–728. With 1 folding map.

Nine species of Glossina inhabit French West Africa, namely, *palpalis, tachinoides, pallicera, morsitans, longipalpis, fusca, nigrofusca, medicorum,* and *tabaniformis,* and this instalment deals with their distribution, which is intimately related with that of the vegetation, in that particular territory. There are three obvious local zones of vegetation, namely, a broad zone of heavy forest; further north, a zone of savannah where heavy forest merely fringes the rivers and water-courses; and still further north, a Saharan zone of acacia-thorn and jujube, where tsetse flies hardly occur. An interesting feature is the map showing the distribution of the several species of Glossina, the distribution of trypanosomiasis, and the localization of big game.

A. A.

JOHNSON (W. B.) & LLOYD (Ll.). **Tsetse Investigation.**—*Nigeria Ann. Med. & San. Rep. for the Period 1919.* 1921. pp. 30–32.

The provinces investigated in Northern Nigeria included the northern part of Nupe, the eastern part of Sokoto, the western and southern part of Kano, the northern part of Zaria, and the middle and northern parts of Bauchi. The survey was continued from June 1921 to April 1922.

The species occurring here are *Glossina palpalis, tachinoides, morsitans, longipalpis* (localized in the extreme south), and *fusca* (a rarity). *G. tachinoides* is the prevalent species, being found wherever there is permanent water and the primary forest has not been farmed out; it is also considered the most important enemy, as it attacks man and cattle as well as game animals, and is known locally to carry sleeping sickness and trypanosomiasis of stock; like *palpalis,* it breeds freely in the dry season, but not, or not so much, in the wet season; its pupae are found in sand (occasionally in cracks in dry mud) generally in open glades of dense forest devoid of low undergrowth; it is computed to get about 20 per cent. of its blood from non-mammal sources, probably monitor lizards. *G. palpalis* is not considered important, though in Nassarawa it is certainly a carrier of sleeping sickness; it occurs in evergreen forest along the larger streams and the permanent hill torrents, being most prevalent in the east and south of Northern Nigeria; its pupae are found in dry sand in forest where there is also low undergrowth. *G. morsitans* has a wide geographical distribution but a limited range; though it needs a comparatively dry climate, it is to be found only where water is near the surface ; though it is never met with apart from a certain amount of game, it is not always found where game is present ; economically it is regarded as more important than *palpalis*, since it excludes stock from many suitably watered tracts ; it breeds freely in the dry season.

Of 322 *morsitans* examined, 3·4 per cent. had flagellates in the gut only, 10 per cent. in the proboscis only, and 5·9 per cent. in both regions. Of 1,084 *tachinoides*, 6 per cent. had flagellates in the gut only, 2·7 per cent. in the proboscis only, and 1·3 per cent. in both regions. Of 437 *palpalis*, 3·2 per cent. had flagellates in the gut only, 1·8 per cent. in the proboscis only, and 0·7 per cent. in both regions.

A. A.

SWYNNERTON (C. F. M.). **The Entomological Aspects of an Outbreak of Sleeping Sickness near Mwanza, Tanganyika Territory.**—*Bull. Entom. Res.* 1923. Jan. Vol. 13. Pt. 3. pp. 317–370. With 6 plates and 1 map.

The minor epidemic of sleeping sickness to which this prompt and well-reasoned report relates has broken out in that northern part of the Mwanza district which borders the Speke Gulf at the south-easterly corner of Lake Victoria.

Some parts of the district are open country, considerably cultivated, pastured and settled, and free from Glossina ; but a great deal of it, including the area of the outbreak, is savannah woodland and acacia thorn-bush, sparsely inhabited by people who live largely by fishing and hunting, and heavily infested with Glossina, of which, however, only one species—the new *G. swynnertoni*—has as yet been found in the area of the outbreak.

In the paths and bush villages of this area *G. swynnertoni* was caught in thousands, and its puparia have even been found in the immediate vicinity of villages. This particular species, in short, has concentrated its attention on man, the reason being, as the author states—with full appreciation of the significance of his statement—that in the particular area of the outbreak game animals have become exceedingly scarce. One cause of this depletion of game was a famine that forced the people to seek their food by hunting.

The author does not pretend to have been able, in the course of a few weeks' survey, to make an exhaustive study of the habits of *G. swynnertoni* ; but he has observed that, given a choice, it has no preference for cattle before the human species, that the females are as bold and range as freely on the wing as the males, and that under the local conditions (absence or paucity of game) "it is an unusually dangerous fly to man." During the author's brief survey (May–June) the insect was dispersed through the bush, but with a tendency to particular activity in thickets of certain kinds, at water-holes, and among *ilula* acacias at the dry edges of open swamps. Puparia were found accumulated in thickets, under trees, among lianas, and in recesses and crannies among broken granite kopjes.

From the propensity of this fly to attack man the author thinks it reasonable that the origin of the outbreak of sleeping sickness might have been an infected immigrant ; and from the abundance of the fly in villages, as well as from the common belief that "going to see the sick and taking the sick in" is the cause of fresh cases, the author believes not only that man is the sole source of infection, but also that direct transmission is possible or even probable.

As emergency measures the author is in favour of evacuation of infected villages, clearing for 150 yards or more on either side of roads, and clearing round villages, fords, halting-grounds, and water-holes ; and further, to hasten the destruction of flies already infected, burning cover, trapping flies, and propaganda.

As a general policy for fly-belts the author believes firmly in attack, and the main line of attack is "judicious settlement"—judicious settlement taking the form of large villages, with encouragement of agriculture (*e.g.* cotton) and stock-raising (cattle and eland)—in the fly-belt or at the borders of it, as circumstances dictate.

A. A.

AUSTEN (E. E.). **A New East African Tsetse-Fly (Genus** *Glossina,* **Wied.), which apparently disseminates Sleeping Sickness.**—*Bull. Entom. Res.* 1923. Jan. Vol. 13. Pt. 3. pp. 311–315. With 3 text figs.

This new species, *Glossina swynnertoni,* is closely related to *G. morsitans,* from which it differs in the darker ground-colouring of the abdomen and the larger and broader dark bands of the individual abdominal terga ; in the male there are also considerable differences in the detail of the genitalia.

A. A

SCHWETZ (J.). **Contribution à l'étude des moeurs de la** *Glossina Schwetzi,* **Newstead.**—*Ann. Soc. Belge de Trop. Med.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 195–207. With 1 map.

Glossina schwetzi is remarkable for sexual dimorphy, the males resembling *G. tabaniformis* and the females *G. brevipalpis.* In habits *G. schwetzi* resembles *G. brevipalpis* in being vespertine, but is also to some extent nocturnal, though less constantly so than *G. fusca* and *tabaniformis.* The males of *G. schwetzi* hover about the ground on paths, after the fashion of *G. brevipalpis,* but the females rest on trees.

A. A.

SCHWETZ (J.). **Quelques nouvelles observations sur les moeurs de la** *Glossina tabaniformis,* **Westw.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 183–194. With 1 map.

G. tabaniformis is common, particularly at the beginning of the dry season, about Kikwit on the Kwilu, a tributary of the Congo. It has the same vesperal and nocturnal habits as *G. fusca,* but is more addicted to the aberration of biting during the day.

A. A.

LAMBORN (W. A.). **Report of Medical Entomologist. Appendix.**—*Annual Med. Rep. on the Health & Sanitary Condition of the Nyasaland Protectorate, for the Year ended 31st December, 1921.* p. 39.

The Chalcid *Syntomosphyrum glossinae* appears not to be a hyper-parasite. The ease with which it can be dealt with, the comparative brevity of its life-cycle, its great fertility, and its longevity seem particularly to recommend it for utilization against Glossina. It can be propagated on other "house-flies," particularly flesh-flies, without any vitiation of the appetite of such offspring for Glossina. The same facility of propagation on an extensive scale was proved for *Mutilla glossinae* also, but in this species the life-cycle is so long—fully two months—and the fecundity apparently so moderate as to be interdictive for practical purposes.

A A.

STEFFAN. **Die Verbreitung der Glossinen.** [Distribution of Glossina.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922 Vol. 26. No. 11. pp. 348–358. With 1 map.

Contains nothing of any particular value to English readers.

A. A.

i. RODHAIN (J.). **Répartition de l'***Ornithodorus moubata* **dans le Bas et le Moyen Congo.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 213–226. With 1 map.
ii. GHESQUIÈRE (Jean). *Ornithodorus moubata* **Murray au Kasai et au Sankuru.**—*Ibid.* pp. 277–283.

i. The present range of *Ornithodorus moubata* in the Lower and Middle Congo is described and charted. The species appears to be generally scattered, either in houses or halting places, between the R. Kwango and the Atlantic coast.

ii. Discusses the distribution of *O. moubata* in a tract east of the R. Kwango. The species undoubtedly has been introduced quite recently; some say from Elizabethville, others from Katanga. An ant-lion is spoken of as a feeble foe of the tick.

A. A.

HOFFMANN (W. H.). **Zur Vererbung von Krankheitserregern in den uebertragenden Insekten nach Beobachtungen an** *Rhodnius prolixus.* [Hereditary Transmission of Microbes. Observations on *R. prolixus.*]—*Muench. Med. Woch.* 1922. Nov. 24. Vol. 69. No. 47. pp. 1623–1624. With 1 text fig.

The author, in Cuba, has kept a female Reduviid bug, *Rhodnius prolixus*, under observation for some time; and in three months it has produced 400 eggs. He observes that young larvae will suck blood from the replete mother and from other replete larvae, and he suggests that this habit may be of a more general occurrence among bloodsucking insects, and that this possibility must be considered in adjudging evidence of alleged hereditary transmission of pathogenic organisms by bloodsucking insects.

A. A.

MACFIE (J. W. S.). **Observations on the Rôle of Cockroaches in Disease.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 441–448.

The following organisms passed, apparently unharmed, through *Periplaneta americana*: *Bacillus tuberculosis* and *leprae*, cysts of

Entamoeba histolytica, coli, and of a *coli*-like species from a monkey, and of *Giardia intestinalis,* and eggs of *Ancylostoma duodenale* and *ceylanicum, Necator americanus, Ascaris lumbricoides, Trichuris trichiura, Taenia saginata,* and *Schistosoma haematobium.*

The following organisms could not be recovered from the faeces of cockroaches after experimental feeding: Active stages of the Entamoebae specified, eggs of *Apiochacta xanthina,* Gonococci, and (in two experiments in each case) *Bacillus typhosus, paratyphosus*-B, and *dysenteriae* (Flexner-Y).

A. A.

DEFIEL (Florence). **An Experimental Investigation of the Supposed Poisonous Qualities of the Colorado Potato Beetle,** *Leptinotarsa decemlineata.—Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 559–567.

The Colorado beetle, *Leptinotarsa* (or *Doryphora*) *decemlineata,* sufficiently notorious for its ruinous effects on potato crops, has been further discredited with the possession of poisonous properties. Here are recorded the results of various experiments with man, rats, chickens, and frogs, which furnish no support whatever for the belief that this beetle is poisonous or possesses even vesicating properties.

A. A.

HASHIMOTO (Takashi) & OGIWARA (Heibu). [**On the Poisonous Moth and Moth Poison Dermatitis that occurred in Chiba Prefecture in 1921.**]—*Hifuki Hitsunyokikwa Zasshi* (*Jl. of Dermat. & Urol.*). 1922. June. Vol. 22. No. 6. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 333.]

It is stated that the authors came to the conclusion that the dermatitis was caused by the mechanical irritation of the hairs of the moth and not by any poisonous secretion. [In some African tiger-moths (Anaphe spp.) the offensive barbed hairs are tubular and have a vesiculous base, as if for the storage and passage of a secretion.]

A. A.

CAWSTON (F. G.). **Antimony in Sand-Worm Disease.** [Correspondence.]—*S. African Med. Rec.* 1923. Feb. 24. p. 94.

The cause of "sand-worm" rash seems not to have been investigated; the author on two occasions has observed insects "somewhat resembling fleas." The rash appears as spreading vesicles, and is very resistant to treatment. The application of iodine may cause the vesicles to suppurate. Recently the author cured a case that had been vainly treated for 18 months, with a few intramuscular injections of 1·5 cc. of colloidal antimony and sulphur, and since then he has heard of a case of rapid disappearance of the rash after two intravenous injections of half a grain of tartar emetic.

A. A.

WALCH (E.). **Over** *Trombicula deliensis*, **n. sp. vermoedelijke overbrengster der Pseudotyphus, en andere Trombiculae van Deli. (Eerste Mededeeling.)** [On *Trombicula deliensis*, n. sp., a Possible Transmitter of Pseudotyphus, and on the other Trombiculae of Deli. (First Communication.)]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 5. pp. 530–570. With 29 text figs. [English summary, p. 568.]

Seven species of Trombicula, six of them said to be new, have been found in Deli and are here characterized and well figured. One of the new species, *T. deliensis*, is conjectured by the author to be the transmitter of pseudotyphus, a variety of Japanese river fever ; it is the only species known locally to attack both man and rodents.

A. A.

ANCONA (Giacomo). **Asma epidemico da " Pediculoides ventricosus."** [Epidemic Asthma due to *Pediculoides ventricosus.*]—*Policlinico.* Sez. Med. 1923. Feb. 1. Vol. 30. No. 2. pp. 45–70.

A large number of those engaged in the milling industry at Barberino suffer from asthma, together with a roseolar, pruriginous eruption, especially of the neck, chest and arms. It was found that those working with sound grain were not affected, but only if the grain was musty from *Tinea granella* and also attacked by *Pediculoides ventricosus*.

By a series of experiments the author showed that the actual cause of the asthma was the last-named. He made extracts in various ways—in saline, in ether, with the mite alive or dead—and in those who suffered from the asthmatic condition he obtained a skin reaction of an anaphylactic type—cutaneously and intracutaneously. Extracts of the sound grain, or of that affected by *T. granella* only, yielded negative results.

Sensitization *may* be due to ingestion of bread made with the damaged flour, but the author is of opinion that it arises by inhalation or by action of the parasite on the nasal mucous membrane.

H. Harold Scott.

MACKENZIE (J.). **Endoparasitic Acari as a Cause of Urinary Diseases. With Notes on Several Cases.**—*Jl. Roy. Army Med. Corps.* 1922. Nov. Vol. 39. No. 5. pp. 339–344. With 1 text fig.

HIRST (Stanley). **Report on the Mite** (*Tarsonemus floricolus*, **Canestrini and Fanzago) found by Lieut.-Col. J. Mackenzie, R.A.M.C., in Human Urine.**—*Ibid.* pp. 344–347. With 1 text fig.

Notes of six cases of urinary disorder associated with the indubitable existence of mites in the urine. In four of them the mite was a Tarsonemus, specifically identified in one instance as *T. floricolus*, and in another instance accompanied with the common sugar-mite (Glycyphagus) ; in the other two cases the kind of mite was not accurately determined. In four of the cases the predominant symptom was inveterate nocturnal enuresis, and in all of them a constant phenomenon of the urine—in addition to mites and their debris—was a black or blackish detritus thought to be the mites' excrement. In most of the cases localized pain was only an occasional symptom ;

but in one case there was a history of " trench nephritis " and persistent aching of head and back and limbs, and in another there was haematuria along with pus, and with pain at the tip of the penis towards the finish of micturition.

A. A.

i. GODOY (Alcides) & PINTO (Cesar). **Da presença dos Symbiontes nos Ixodidas.**—*Brazil Medico.* 1922. Nov. 25. Year 36. Vol. 2. No. 47. p. 335.

ii. BAMBAREN (Carlos A.). **Estudio de la larva parásita de un acaro** (*Leptus japa*, **Ribeyro-Bambarén) de la montaña del Perú.** [The Parasitic Larva of *Leptus japa*, Ribeyro-Bamberen, from the Highlands of Peru.]—*Crónica Méd.* Lima. 1922. Aug. Vol. 39. No. 710. pp. 281–287. With 2 text figs.

iii. EVANS (A. M.). **The Occurrence of** *Xenopsylla astia*, **Roths., in West Africa.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. p. 449.

iv. RIGOLLET. **Au sujet de la répartition de la puce en Afrique Occidentale Française.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. p. 1018.

v. PAWLOWSKY (E.) & STEIN (A.). **Taches bleues et glandes salivaires du** *Phtirius inguinalis.*—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 826–827.

vi. CORNWALL (J. W.). **Note on the Salivary Glands and Sucking Apparatus of** *Cimex rotundatus.*—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 687–691. With 4 plates.

vii. NEIVA (Arthur) & PINTO (Cezar). **Estudo actual dos conhecimentos sobre o genero** *Rhodnius*, **Stal, com a descripção de uma nova especie.** —*Brazil-Medico.* 1923. Jan. 13. Year 37. Vol. 1. No. 2. pp. 20–24.

i. A very brief notice of a micro-organism having a predilection for the ovaries of certain species of Ixodidae and presumed to be not a parasite but a symbiote. The authors name it " Ixodisymbionte," and note that it was first discovered by R. KOCH in Rhipicephalus.

ii. A description of a very common Trombidiid larva, known locally as Japa or Isangue, which, by its burrowing, causes severe pruritus. It lives in the grass of the Peruvian highlands, but not in the plains. The adult is not known, but the larva is recorded as a new species under the name of *Leptus japa.*

iii. *Xenopsylla astia* observed on *Mus decumanus* and *Cricetomys gambianus* in April.

iv. A request for collections of fleas of French West Africa to be sent to the author at the Institut de Biologie.

v. The authors succeeded in producing the blue spots on the skin characteristic of the attacks of the crab-louse by injecting the secretion of the glands called by them the third pair of salivary glands of that insect.

vi. The salivary glands of the bed-bug are described and figured in many transverse sections and diagrammatic drawings. For steadying the bug for dissection the plan here recommended is to fix it by its legs and ventral surface to a block of paraffin, by melting. The dorsal chitin being then dissected off, the salivary glands and ducts can be conveniently examined with a 4 mm. objective.

vii. The new species, *Rhodnius domesticus*, from Brazil, frequents houses.

A. A.

SAMBON (Louis Westenra). **A Synopsis of the Family** ***Linguatulidae.*** —*Jl. Trop. Med. & Hyg.* 1922. Dec. 15. Vol. 25. No. 24. pp. 391–428. With 25 text figs.

This final instalment of Sambon's valuable monograph contains, besides descriptions and figures and critical appreciations of many new species, a classified catalogue of the Linguatulida, a list of the known species arranged according to their respective hosts and their geographical distribution, a classified catalogue of hosts with their respective Linguatulid parasites, and an index of names and synonyms.

A. A.

PONS (R.) & NOC (F.). **Porocéphaliase ganglionnaire et Lymphadénie tuberculeuse á évolution rapide chez un Tirailleur Sénégalais.** —*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 951–954.

A case of acute tuberculosis in a native Senegalese soldier serving in France. Post-mortem examination showed that the infection was restricted to the lymphatic system—all the glands everywhere being enlarged. Some of the glands were also infested with larvae of *Porocephalus* (*Armillifer*) *armillatus*, and here again infestation was restricted to lymphatic glands. Though cases of acute tuberculous lymphadenitis are well known apart from any other antecedent or concurrent infection, the possibility that in this particular case the primary infestation with Porocephalus larvae may have been a predisposing cause must not be dismissed.

A. A.

OLIVER (Thomas). **Adder Bite.**—*Brit. Med. Jl.* 1922. Dec. 9. pp. 1114–1115.

Case of a woman, aged 54, bitten above the left ankle by an adder. An hour afterwards the wound was "dressed" and a stimulant was given, severe vomiting and diarrhoea having occurred. Subsequently the patient collapsed and "felt extremely ill," and the leg, which was red but not very tender, was found to be swollen up to the knee. The leg was dressed with ichthyol and glycerine. Vomiting and diarrhoea continued at intervals for "a few hours." The patient gradually got better, but it was three months before the swelling of the ankle disappeared.

A. A.

TAYLOR (Mark R.). **A Case of Adder Bite.**—*Brit. Med. Jl.* 1923. Mar. 3. p. 375.

The interest of this case is that it illustrates the delay that sometimes occurs in viperine intoxication between the infliction of the bite instilling the venom and the generalization of symptoms.

A. A.

YAMAGUTI (K.). **Zusammenfassung meiner vergleichenden serologischen Untersuchungen der Toxine von Giftschlangen auf der Insel Formosa.** [Comparative Serological Investigations of the Toxins of Poisonous Snakes in Formosa.]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1922. July. No. 223. German summary, pp. 5–19. [Japanese version, pp. 39–50.]

In Formosa during the 15 years 1904–1918 the annual number of accidents from venomous snakes has averaged 272 and of deaths 20. The venomous snakes of the island include four species of *Lachesis, Ancistrodon acutus,* Russell's viper, a Bungarus, the cobra, *Callophis swinhoei,* and a Hemibungarus. Half of the accidents are caused by *Lachesis gramineus,* and another quarter by *Lachesis mucrosquamatus.* Of the comparatively few fatal cases, Bungarus has accounted for 24 per cent., Ancistrodon for 23 per cent., cobra for 17 per cent., *Lachesis mucrosquamatus* for 9 per cent., and *L. gramineus* for only 1 per cent. The venom apparatus and the action of the venom of all these snakes is described at length.

A. A.

PACELLA (G.). **Action des venins de serpents sur les centres bulbaires.** —*C.R. Soc. Biol.* 1923. Feb. 10. Vol. 88. No. 5. pp. 366–367.

The effects of the venom of *Naja tripudians, Vipera russellii, Crotalus terrificus,* and four species of Lachesis, introduced—by a described technique—into the bulbar centres direct, are here described, and they appear to differ considerably from the obvious effects of most of them when introduced into the circulation or subcutaneously. There is with most of them a rapid and persistent rise of arterial pressure and (particularly with cobra venom) marked bradycardia; respiration is at first unaltered or slightly accelerated, then becomes less frequent, and finally stops, often after a Cheyne-Stokes phase; no motor symptoms are observed (except with the Crotalus venom), and often no alteration of the coagulability of the blood or of the excitability of phrenic and sciatic nerves. Death supervenes on apnoea of some duration.

A. A.

i. KRAUS (R.) & BOTELHO (Rocha). **Uma nova contribuição á avidez das anti-toxinas. Soro anti-escorpionico. A provo de anti-toxinas principaes e secundarias, pela avidez. (2a Communiçãcio.)** —*Brazil Medico.* 1923. Feb. 10. Year 37. Vol. 1. No. 6. pp. 69–72. With 4 text figs.

ii. —— & ——. **Sobre o soro anti-elapineo. Nova contribuição para o conhecimento de anti-toxinas e co-anti-toxinas. (3a Communicação.)**—*Ibid.* Feb. 17. No. 7. pp. 81–82.

i. A series of interesting experiments with scorpion venom and scorpion antivenene is here recorded, from which the authors conclude that, just as there appear to exist primary and secondary agglutinins and partial bacterial antitoxins, so there appear to be primary and secondary antitoxins of animal origin, of which the former act at once and the latter only after some delay. From among the present experiments may be selected one showing that scorpion antivenene can, after contact for an hour at 37° C., neutralize four lethal doses of *Lachesis lanceolatus* venom.

ii. Further experiments here recorded show that antivenene of *Elaps frontalis* can neutralize four times its equivalent of *Elaps corallinus* venom, after contact for an hour at 37° C.; and also, after contact for an hour at 32° C., can neutralize a minimum lethal dose of *Crotalus terrificus* venom, although the Crotalus antivenene does not neutralize the Elaps venom The Elaps antivenene has no effect under any circumstances on Lachesis venom.

A. A.

BARDIER (E.) & STILLMUNKÈS (A.). **Intoxication scorpionique et syncope adrénalino-chloroformique.**—*C.R. Soc. Biol.* 1923. Mar. 3. Vol. 88. No. 8. pp. 559–561.

The venom of the Algerian scorpion, although its cardiovascular effects considerably resemble those of adrenalin, does not, like adrenalin, cause fatal syncope in the course of chloroform anaesthesia; on the contrary, scorpion intoxication inhibits this effect of adrenalin.

A. A.

i. NOVARO (Vincent). **Action toxique du venin de Crapaud pour l'homme et les animaux.**—*C.R. Soc. Biol.* 1922. July–Sept. Vol. 87. No. 28. pp. 824–826.

ii. ——. **Action pharmacodynamique du venin de Crapaud.**—*Ibid.* 1923. Feb. 10. Vol. 88. No. 5. pp. 371–373.

i. In the author's country toads are still used in the treatment of toothache and herpes. He tells of an ordinary case of facial herpes, not at all serious to begin with, which suddenly became frightfully exacerbated locally, went on to paralysis of the lower limbs, convulsions and opisthotonus, and ended fatally. It transpired that living toads had been applied to the skin lesions.

The author accordingly made some experiments with the granulous venom of the toad [the milky venom secreted by the animal's cutaneous parotid glands]. He strapped living toads on to the abdomen of dogs and excited the secretion of the venom. If the dog's skin were scarified, bradycardia, intense mydriasis, salivation, vomiting, respiratory disturbances, paralysis and convulsions quickly followed, and ended in death within an hour. If the dog's skin were merely excoriated the results of contact with the parotid glands of the living toad were local ulceration and suppuration and general cachexia from which recovery was slow.

The expressed parotid (cutaneous) venom of Buenos Aires toads is fatal in small doses subcutaneously to pigeons, rabbits, guinea-pigs, etc., and in (comparatively) very large doses to frogs and rats; whereas the toad itself is quite indifferent to the (comparatively) enormous dose of 500 mgm.

ii. An instalment containing an interesting account of the venomous secretion of the "parotid" gland of the toad, *Bufo marinus*. [The parotids of the toad form the cutaneous excrescences behind the eye and above the tympanum.] 25 mgm. of the fresh venom per kilogm. of body weight are fatal to the dog by intravenous injection. Most of the effects of the venom depend upon the 1–3·5 per cent. of adrenalin that it contains. But, although the venom gives the reactions and produces most of the obvious effects of adrenalin, it also contains some independent and even contradictory principles. Thus it causes convulsions when injected subcutaneously, and it contracts the isolated intestine of the guinea-pig. Generally it does not modify the coagulability of the blood ; when applied to a wound it causes congestion and inflammation ; and when it comes in contact with the conjunctiva, though it produces a transient pallor, it leads to protracted conjunctivitis and perisclerítis.

A. A.

AOKI (T.). **Ueber Medusenstichkrankheit.** [Medusa-sting Sickness.]—*Japan Ztschr. f. Dermat. u. Urol.* 1922. Oct. Vol. 22. No. 10. German Autoreferat, pp. 71–72. With 1 plate. In Japanese, pp. 835–891.

The venoms of Medusae differ greatly in potency. Those of the Scyphomedusae (Acraspedote medusae) and Ctenophora cause but slight or transient symptoms, but those of the Hydromedusae (Craspedota) have serious effects.

This paper deals with the venom of *Olindioides formosa,* one of the latter group. Contact with this medusa is followed by sudden burning pain and erythema, or, in some cases, severe urticaria. In the most severe cases restlessness, faintness and extreme prostration supervene with diffused muscular pains, dyspnoea, and cardiac distress, and these symptoms generally last 24 hours.

A. A.

i. KRAUS (R.). **Biologische Studien ueber Gifte der Kopfdrüsen ungiftiger Schlangen. (I. Mitteilung.)** [Biological Studies of the Venom from the Head Glands of some Harmless Snakes.]—*Muench. Med. Woch.* 1922. Sept. 1. Vol. 69. No. 35. p. 1277.

ii. KAISER (Ludwig). **Ueber Giftschlangen und Anti-schlangengiftserum-Bereitung in Niederlandisch-Ostindien.** [Poisonous Snakes and the Preparation of Antivenom Serum in Dutch East Indies.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 509–524. With 3 plates.

iii. BOLOGNESI (G.). **[Experimental Research on Snake Bites.]**—*Arch. Franco-Belges de Chirurgie.* Brussels. 1922. Aug. Vol. 25. No. 11. p. 1010. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Feb. 10. Vol. 80. No. 6. p. 434.]

i. A retrospect on the subject of the venoms of the Aglyph and Opisthoglyph Colubridae.

ii. This paper contains some interesting statistics that illustrate the difficulties of immunizing horses against snake-venom for the production of antivenene.

iii. Merely a statement that Bolognesi's aim is to draw " attention to the local histopathological findings " in snake-bite.

A. A.

BAKER (Frank Collins). **The Molluscan Fauna of the Big Vermilion River, Illinois.**—*Illinois Biological Monographs.* 1922. Apr. Vol. 7. No. 2. 126 pp. With 15 plates.

The object of the survey of which the results are here recorded was to investigate the rapid depletion of the local supply of freshwater mussels. The survey took account of everything that appeared to affect molluscan life. Numerous pulmonate Gastropods, including four species of Planorbis, are included in the fauna of the river. The point of general interest is that in the Big Vermilion River, which is 90 miles long, sewage pollution was found to have killed all clean water life for a distance of 14 miles, and to have deteriorated the environment to a distance of 20 miles, from the source of pollution. Sewage pollution includes contamination both from industries and from "organic" sewage, the latter, when crude and concentrated, being very injurious to aquatic life. The paper contains also a good deal of recorded evidence of the deadly effect of sewage in other neighbouring rivers.

A. A.

EDWARDS (F. W.). **A Synopsis of Adult Oriental Culicine (including Megarhinine and Sabethine) Mosquitoes. Part II.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 430–475. With 3 plates.

GHOSH (Ekendranath). **On a New Ciliate,** *Balantidium blattarum*, **sp. nov., Intestinal Parasite in the Common Cockroach** (*Blatta americana*).—*Parasitology.* 1922. Apr. Vol. 14. No. 1. pp. 15–16. With 1 text fig.

HOFFMANN (W. H.). **Die Chrysopsfliegen und ihre Bedeutung für den Tropenarzt.** [Flies of the Genus Chrysops and their Significance in Tropical Medicine.] *Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Aug. Vol. 26. No. 8. pp. 244–248. With 1 text fig.

DE MELLO (Froilano) & SUCTANCAR (Crisna). **Morphologie et cycle évolutif d'un** *Herpetomonas* **de l'intestin d'***Hemidactylus Brookei* **Gray.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 795–797. With 1 text fig.

PARK (G. W.). *Gambusia affinis*, **the Natural Agent for destroying Mosquito Breeding in Texas.**—*Texas State Jl. Med.* 1922. Apr. Vol. 17. No. 12. pp. 579–581. With 2 figs.

SENEVET (G.). **Les espèces Algériennes du Genre Hyalomma.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 393–418. With 7 text figs.

TALIAFERRO (W. H.) & BECKER (Elery R.). **The Human Intestinal Amoeba,** *Iodamoeba williamsi.* **and its Cysts (Iodine Cysts).**—*Amer. Jl. Hyg.* Baltimore. 1922. Mar. Vol. 2. No. 2. pp. 188–207. With 2 plates & 3 text figs.

LEPROSY.

JANIN (F.). **La lèpre à la surface du globe.**—*Rev. Méd. et Hyg. Trop.* 1922. Nov.–Dec. Vol. 14. No. 6. pp. 225–227.

The most striking feature in the distribution of leprosy is that in the tropics there is a continuous belt of the disease right round the globe, while in the temperate zone disseminated foci are found at variable intervals. In the middle ages the disease was widespread over Europe. The decrease there is in part due to the rigorous measures taken against leprosy, but no such decrease has occurred in the tropical zone, and the author suggests that the greater prevalence in the tropics may be associated with deficiency of calcium in the rice diet, so largely consumed in that area, in contrast with the more mineralized wheat diet in the temperate zone.

L. Rogers.

VERNET (Isaac). **O serviço clinico da lepra no Hospital S. Sebastião em 1921.**—*Rev. Med.-Cirurg. do Brasil.* 1922. Feb. Vol. 30. No. 2. pp. 65-71.

In October, 1921, two wards of the Hospital S. Sebastião (Rio de Janeiro) were set apart for the reception and isolation of 40 male and 30 female patients suffering from leprosy. During the last three months of 1921 the figures showed :

Admitted		141
Discharged	24	65
Died	22	
Transferred	19	
In hospital		76

The patients "discharged" are not to be regarded as "cured." Some were transferred to other states of the Republic and placed under the observation and control of the local "Inspectoria de Prophylaxia Rural," while others, possessed of resources, were allowed to go to their homes, remaining, of course, under strict official medical observation. The 19 "transferred" patients were removed to other hospitals or to other wards of the Hospital S. Sebastião, repeated bacteriological and clinical examinations having failed, in their case, to reveal evidence of leprosy.

F. S. Arnold.

MEIRELLES (Eduardo). **Da lepra infantil no Rio de Janeiro.**—*Arch. Brasileiros de Med.* 1922. Dec. Vol. 12. No. 12. pp. 975–991.

Several interesting tables of statistics are given from various institutions showing the numbers of children of tender age who are leprous. The main facts to be gleaned from these data are : that white children are more frequently affected than half-castes or natives ; that a large majority show the cutaneous forms, very few the nervous ; that female cases preponderate ; and that the condition is rare in the first four years of life, but the numbers increase year by year after the seventh or eighth.

H. Harold Scott.

ESGUERRA (Carlos). **El problema de la lepra en Colombia.** [The Problem of Leprosy in Colombia.]—*Repert. de Med. y Cirug.* 1922. Mar. Vol. 13. No. 6. (No. 150.) pp. 291-305.

Thirty years ago a resolution was carried, after discussion by the National Academy of Medicine, that lepers in Colombia should be removed to some island in the Atlantic or Pacific. Investigation revealed at least 10,000 persons to be provided for, so that for financial reasons the project was abandoned. Instead, the existing lazarettos were utilized, while hospitals were founded in the departments most affected for dealing with those who could not or would not be admitted to the former. In 1917-18 a law was passed to the effect that all lepers were to be segregated in national lazarettos, irrespective of their social or pecuniary position, or of the form or stage of the disease.

In considering the subject afresh, the author starts by drawing comparisons between the infectivity of leprosy, tuberculosis, syphilis and other diseases, incidentally pointing out that, apart from the fact that in the middle ages the term " leprosy " probably included many cases of syphilis, lupus and contagious skin affections, the disease itself is not of such a virulent type as formerly, and that, therefore, the harsh measures of bygone days, which are not mitigated to a great extent even now, are no longer necessary.

The suggestion brought forward by Dr. Esguerra is that departmental and municipal bodies and voluntary societies should work together, the two former improving and maintaining " national lazarettos " for poor patients, providing them with ground for agricultural employment and with schools for leprous children, while the healthy children should attend other schools and be subjected to periodical medical examination, so that any who show evidence of the disease may be at once transferred.

The San Lazaro societies would, in association with municipal and other local medical practitioners, have more particular care of the better class patients, who would be allowed to live in houses with their families, if they too were infected. The estimated cost of carrying out these suggestions is considerably less than by the present system of an expensive department administered centrally.

H. Harold Scott.

IGNACIO URIBE (Jose). **Sobre Lepra.** [Leprosy.]—*Repert de Med. y Cirug.* Bogota. 1922. Dec. Vol. 14. No. 3. (No. 159.) pp. 90-99.

Leprosy has been rife in Colombia for many years. Statistics were started in 1905 when there were recorded to be 4,296 cases, of which 2,359 were females and 1,937 males. In 1922 the numbers were 6,568, of whom 5,440, or 82·8 per cent., were segregated, and of these 2,845 were males and 2,595 females. As regards the type of disease 60 per cent. were of the nodular variety, 30 per cent. nervous, and 10 per cent. mixed.

The system adopted for segregation is the formation of " colonies with hospitals " ; each colony has a regular administration with a chief magistrate, judges, police service, and so forth.

H. Harold Scott.

VALVERDE (Belmiro). **Estado actual da lepra no Brasil.**—*Arch. Brasileiros de Med.* 1921. Sept. Vol. 11. No. 9. pp. 702–729.

The author begins by classifying the states of Brazil as follows, according to the prevalence within them of leprosy :

1. States in which leprosy is rare : Parahyba, Piauhy, Rio Grande do Norte, Alagoas, Seraipe, Bahia, Espirito Santo and Matto Grosso.

2. States in which leprosy is frequent : Amazonas, Ceara, Pernambuco, Rio de Janeiro, Capital Federal, Parana, Goyaz, Santa Catharina and Rio Grande do Sul.

3. States in which leprosy is " abundant " : Para, Maranhao, Minas and S. Paulo.

The states are then considered in succession, a succinct account being given of the position as regards leprosy in each. It would appear that whereas the state of Bahia was formerly one of the principal foci of leprosy, the disease there is now rare, so much so that the author asserts that, born and brought up in the state as he was, he has never seen a case of leprosy in the interior and but few in the capital. The change, according to the author, is not to be attributed to any special precautions adopted in the state, of which there have been none. The history of Bahia is in marked contrast to that of the other states, in which the position as regards prevalence of leprosy has grown steadily worse. It would appear that little or nothing has been or is being done by government to deal effectively with the situation, which is already one of great gravity. In the absence of official statistics it is impossible to do more than attempt an approximate estimate of the total number of lepers in Brazil. The author's estimate is 15,000. Others quoted by him vary from 5,000 (Octavio de FREITAS) to 30,000 (Adolpho LINDEMBERG).

F. S. Arnold.

VERNET (Isaac). **Considerações em torno da prophylaxia social da lepra.**—*Brazil-Medico.* 1922. July 29. Year 36. Vol. 2. No. 30. pp. 61–64.

The author estimates the number of patients in Brazil suffering from leprosy at about 15,000. Little has been done up to now in the direction of an efficient handling of the problem in public health presented by the existence of this large body of sufferers. Two leper colonies are mentioned as already existing and four others are being established. The author speaks very highly of " Chaulmoogrol," basing his verdict on his experience as chief physician to the two leper wards of the S. Sebastian Hospital. The drug, he states, caused an intense bacteriolysis, the signs of which are obvious under the microscope. So uniform is the phenomenon in cases of leprosy that Dr. Paulo PROENÇA, Director of the Bacteriological Laboratory of the Inspectorate of Leprosy, states that the cases treated by Chaulmoogrol can be picked out unfailingly by the microscopist from those not so treated. The author has given 3,000 injections of chaulmoogrol during the period of his charge of the leprosy wards and states that in that number there were only 16 cases of reaction at all severe or prolonged.

F. S. Arnold.

TANGANYIKA TERRITORY. **Annual Medical Report** [SHIRCORE (J. O.), Acting P.M.O.]. **Annual Report of the Sanitation Branch of the Medical Dept.** [SCOTT (R. R.), Medical Officer of Health]. **Report of the Dar-Es-Salaam Laboratory. For the Year 1921.** [Leprosy, pp. 13–20 and 73–74.]

The Germans' policy of segregating lepers in suitable places has been continued under the British administration, 39 camps being occupied in 20 districts. Reports from 11 stations show that at least 50 per cent. are self-supporting, with several square miles of cultivated land attached; £248 was spent on providing for the maimed. The district medical officers visit the camps whenever possible and several are cared for by various missions, a total of £3,880 being expended on the 3,920 known lepers. The concentration of the lepers in a smaller number of large camps is under consideration, but presents many difficulties in such an extensive territory, and until this is done the new forms of treatment, on the efficacy of which " most authorities are agreed," cannot be regularly undertaken, while as the present system of segregation depends on merely a nominal and moral control, care must be taken to avoid painful methods which might lead to extensive desertions. The seriousness of the problem is evident from the statement that " Leprosy is possibly more prevalent in this Territory, if expressed as cases per thousand of inhabitants, than in any other part of the British Empire," last year's report having shown that the incidence of segregated lepers is 7 per mille, " while if those at large be included, the case incidence is probably nearly double that figure." The opinion is expressed that if funds were available for complete segregation and effective treatment, " there does not appear a shadow of doubt that in the course of a generation the leprosy-incidence could be so reduced in Tanganyika by effective means of isolation as to render the disease, to all intents and purposes, non-existent."

L. R.

SERRA (Alberto). **La lepra sarda fino al 1921 (rassegna statistica, epidemiologica, considerazioni profilattiche).** [Leprosy in Sardinia. Statistical and Epidemiological Review. Prophylaxis.]—*Giorn. Ital. d. malattie veneree e della pella.* 1922. June 29. Vol. 63. No. 3. pp. 767–788.

Leprosy was first recorded in Sardinia in 1896. In 1902 there were 43 cases, five years later there were 50, and in 1918, 67. During 1921 30 deaths occurred from this disease and 47 were living. Of these 8 were of the nodular type, 13 of the mixed, and 26 of the nervous forms. Fourteen of them showed mutilations. The ages of the patients varied between 17 and 72 years.

The author points out that necessary measures against leprosy are more rigorous and more rationally carried out in the colonies than in Europe, and the advantages of adherence to the recommendations of the Conferences at Vienna (1892), Berlin (1904), and Bergen (1909)—compulsory notification, isolation of the sick, separation of healthy children from leprous parents, prohibition of the infected from engaging in trades which might tend to the dissemination of the disease. In Norway, where these measures are more strictly attended to,, the number of lepers has been reduced from 2,833 in 1856 to 438 in 1907, while from Denmark leprosy has apparently been banished altogether.

In Italy the problem is not attacked with sufficient energy. The fact must be borne in mind that leprosy is a parasitic disease and that the leper is a dangerous carrier, especially in the florid nodular form, capable of transmitting his disease by contact, direct or mediate. The only adequate protective measure is isolation and, since the period of segregation will probably be of long duration, the asylum must be made as attractive as possible and suitable occupation must be provided for the untortunate sojourners. Finally, to eradicate the disease from Italy, he recommends the establishment of four or five separate leper colonies, one in the endemic area of Riviera Ligure, one in Central Italy at Toscana or Romagna, one at Lecce or Taranto, one in Sicily, and one in Sardinia. At the same time notification and segregation must be stringently enforced.

H. Harold Scott.

GOUZIEN & ABBATUCCI. **Note au sujet de la prophylaxie de la lèpre en France.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 827–830.

In spite of numerous leprosy-infected persons returning to France from her tropical possessions, no legislative powers exist for dealing with them. Some are taken temporarily into the hospital of the Pasteur Institute, and a number have been treated in the St. Louis hospital, although in 1919 a Commission of Public Health reported on the subject, and as long ago as 1909 a Committee of the Société de Pathologie Exotique drew attention to the danger.

L. R.

PUBLIC HEALTH REPORTS. 1922. Dec. 22. Vol. 37. No. 51. pp. 3151–3154.—**Regulations governing the Care of Lepers.**

The United States Secretary of the Treasury has published regulations for the information of health officers regarding admissions to and discharges from the national leprosarium at Carville. These provide for reports by boards of not less than three medical officers to confirm the diagnosis on arrival and to authorize any discharge after recovery. Six negative monthly bacteriological examinations are required before removal from the portion of the reservation used by patients with active leprosy, and 12 further monthly negative reports before the release of such patients, after which the local health officer where the patient resides shall make clinical and bacteriological examinations every six months for a further period of three years. All very wise procedures.

L. R.

VAN DRIEL (B. M.). **Het parole systeem bij lepra.** [The Parole System in Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 5. pp. 527–529.

Van Driel criticizes the parole system in use in Hawaii, which DE LANGEN (this *Bulletin*, Vol. 20, p. 151) described as attractive. There exists no certainty that those going on parole do not excrete the bacillus and there is in practice no control of the accommodation and habits of the parole lepers. Patients as well as the public are being deceived in this way. Van Driel considers the parole system to be a premature consequence of the enthusiasm about the results of the new treatment. Isolation, the only effective measure in combating leprosy so far, is made imaginary by the parole system.

W. J. Bais.

DENNEY (Oswald E.) & HOPKINS (Ralph). **Specified Leprous Reactions and Abnormal Vaccinia induced in Lepers by Smallpox Vaccination.**—*Public Health Rep.* 1922. Dec. 22. Vol. 37. No. 51. pp. 3141–3149. With 5 figs.

Vaccinations against smallpox were performed in the United States National Leprosarium on 118 lepers and 105 healthy attendants with normal results in the latter, but abnormally severe reactions in most of the lepers and alarming symptoms in 11 of them. The inflammatory areola during the pustular stage spread in a few days over the whole arm, with great swelling and pain and fever (39°–40° C.) for from one to three weeks, and the ulcers took one or two months to heal. In nodular cases the old leprous lesions showed inflammatory changes, followed by the appearance of numerous similar new tubercles and infiltrated patches containing numerous lepra bacilli, up to about the twelfth day, and then rapidly returning to the pre-vaccination state. In maculo-anesthetic cases ulnar neuritis with ordinary leper fever appeared usually in the vaccinated arm, frequently in both arms and rarely only in the unvaccinated one, while mixed cases showed a combination of both types of lesion. These febrile attacks occurred in 51 of the 71 lepers, which is far more frequent than the ordinary incidence ; they took place in cases which had not previously shown them, having clearly been excited by the vaccination, so that the symptoms of both diseases appear to be exaggerated when lepers are vaccinated, while the appearances are very similar to the reactions occurring during the treatment of leprosy by iodides, chaulmoogrates, etc., and often followed by improvement. It is of interest to note that in every case the fresh lesions completely subsided and some of the patients appeared to be improved ; they will be carefully watched.

L. R.

HASSELTINE (H. E.). **The Effect of Vaccinia on Leprosy.**—*Public Health Rep.* 1923. Jan. 5. Vol. 38. No. 1. pp. 1–10.

The vaccination of lepers at the Kalihi Hospital in Honolulu has been followed by a more or less acute outbreak of leprous eruptions similar to those occasionally seen in the course of leprosy, and to those above described, and it is suggested that the early reports of leprosy following vaccination in Hawaii may sometimes have been only similar reactions.

L. R.

VALVERDE (Belmiro). **Manifestação inicial da lepra.** [The Primary Manifestation of Leprosy.]—*Arch. Brasileiros de Med.* 1922. Dec. Vol. 12. No. 12. pp. 965–974.

In many cases the primary lesion of leprosy is not discoverable ; in the majority of the remainder the nasal mucous membrane appears to be the portal of entry of the bacillus, but in a few cases it may enter by the skin. A case is recorded in which there was a localized leproma in the right temporal region; this was excised and during the succeeding eight months the patient was watched, but there was no generalization and no local recurrence.

H. Harold Scott.

VAN DRIEL (B. M.). **De uitkomsten van een oogonderzoek bij 350 lepreuzen.** [The Results of an Ophthalmological Examination of 350 Lepers.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 6. pp. 770–814.

Van Driel examined the eyes of 350 inmates of the leper colony, Laoe si Momo (E.C. Sumatra). For practical reasons the examination was confined to the externally visible parts of the eye and its adnexa. The results are given in tabular form (17 pp.).

Apart from affections which may readily be attributed to other causes (conjunctivitis, leucoma from smallpox, traumatic scars, etc.), the author describes as ocular manifestations of leprosy: a hanging fold of the upper lid (blepharochalazis), episcleritis, the ivory-like pannus leprosus round the whole cornea, thin maculae and nebulae corneae, remains of iritis and irido-cyclitis (Descemet spots, pigment on lens capsule), though acute iritis was not very often met with. Keratitis punctata superficialis is considered to be a complication (infection from the nose, which is often the seat of secondary inflammation).

Ophthalmic leprosy, the author thinks, is endogenous in its origin and not brought on per contiguitatem from the surrounding affected areas of the skin. The central localization of the leprous affection of the eye is in favour of this opinion. Leprosy of the eye seldom ultimately causes blindness by chronic relapsing irido-cyclitis.

W. J. Bais.

LEVITT (Marcus J.). **A Case of Leprous Keratitis Punctata.**—*New York Med. Jl. & Med. Record.* 1922. Oct. 4. Vol. 116. No. 7. pp. 376–379.

A man, 37 years of age, was under treatment for recurrent keratitis punctata affecting the two eyes at eight-years' interval. On careful enquiry, he was found to be suffering from a few leprous nodules on the lower part of the body and legs only, and under intramuscular injections of chaulmoogra oil both the skin and eye lesions greatly improved. The difference between the leprous and the ordinary interstitial keratitis is that the membrane in the former becomes white and thickened.

L. R.

ARCHIBALD (R. G.). **An Unusual Type of Nodular Leprosy in the Sudan.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 341–346. With 1 plate.

A typical case of nodular leprosy of one-year's duration, with small shotty tubercular lesions, some slightly umbilicated, and thickening of the ears. It was not recognized as leprosy until a microscopical examination was made, the disease not being very commonly seen at Khartoum.

L. R.

DELAMARE (Gabriel). **Hyperostoses lépreuses du tibia et du péroné.**—*Bull. Acad. Méd.* 1922. Nov. 14. Vol. 88. 3rd Ser. No. 37. pp. 247–248.

A case of nodular leprosy free from all signs of syphilis is reported in which thickened nodes were present in the tibia and fibula.

L. R.

MALLANNAH (S.). **Infection by** *Bacillus pyocyaneus* **simulating Leprosy.**—*Brit. Med. Jl.* 1922. Dec. 23. p. 1223.

A man with perforating ulcers of his foot of one-year's duration, and several white discoloured patches of skin on various parts of the body without anaesthesia, had been treated for leprosy, but the ulcers showed only *B. pyocyaneus* and healed under vaccines, while the patches proved to be due to *Microsporon furfur*, which cleared up under sodium hyposulphite.

L. R.

UNNA (P. G.). **Die Behandlung und Heilung der Lepra.** [The Treatment and Cure of Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1920. Vol. 60. No. 5. pp. 683–703.

The difficulty of attacking the lepra bacilli is due, firstly, to their protective fatty envelope; secondly, to the fact that they are, in the older nodules at least, embedded in a zoogloea; and, thirdly, owing to the obstructed lymph-flow, medicaments cannot reach them. Hence the need for a preparatory form of treatment to precede the actual attacking of the bacilli in situ.

Extirpation of the nodes being impossible on account of their number, the removal of the surface by means of a razor is recommended to allow the penetration of the desired medicament.

After a preparatory hot bath—the Kutsatsu Lepra-bath of Japan—applied for three minutes at a temperature of 45°–53° C., in addition to which hot irons may be applied over flannel, caustic potash or salicylic acid (as an ointment with pyrogallol and resorcin, or creosote) is applied, or an ointment containing pepsin, hydrochloric acid, carbolic acid and eucarin may be used and possesses the advantage of causing no pain; or a combination of the two methods.

Carbolic acid also has given good results when injected in 1 per cent. solution drop by drop into freshly developing nodules.

For the face the milder resorcin is preferred, but not the strong 40 per cent. resorcin paste (pasta lepismatica) which may so disperse the bacilli as to produce a widespread outbreak of fresh nodules. If the whole body is affected pyrogallol ointment (pyrogallol 5, ichthyol 5, salicylic acid 2, vaseline 86 parts) is recommended, or 10 per cent. pyrogallol and salicylic acid. Hydrochloric acid is also given internally from the beginning of treatment.

The use of injections of the oils of chaulmoogra and camphor is next mentioned and the internal administration of strychnine in pill form.

For the eye manifestations the author uses pyraloxin (pyrogallol oxidized by alkalies) with adrenalin and borax.

Other preparations receive brief mention, namely, mustard, zinc sulphate and carbonate, ichthyol (internally and locally) and "cignolin."

After recommending these many preparations [their very number would seem to imply a doubt as to their efficacy] the author naïvely states that one must ever bear in mind internal treatment with chaulmoogra, since the prognosis is best in those who can tolerate this drug in large doses.

H. Harold Scott.

DUBREUILH (William). **Traitement de la lèpre.**—*Jl. Méd. de Bordeaux.* 1923. Mar. 10. Vol. 95. No. 5. pp. 151–154.

This paper contains a general review of the treatment of leprosy from the historical point of view. It is first pointed out that hitherto few advanced cases of leprosy have been cured, although the infection may die out in some nerve forms, and early cases may recover more frequently than is thought. Treatment by serums, such as that of CASRASQUILLA, and various forms of vaccines, including nastine, leperlin and tuberculin, produced only temporary improvement; metals, such as mercury and arsenic, also failed, unless the very recent results with eparsano are confirmed and found to be lasting, while chaulmoogra oil was only slightly beneficial by oral administration, but much more brilliant results have been obtained by the various methods of injecting soluble preparations of this and other oils, although they are still largely in the experimental stage.

L. R.

BENCHETRIT (A.). **Disertaciones acerca de la lepra. (Primera Serie.)** [Dissertations on Leprosy. (First Series.)]—*Tipografia Vargas Caracas.* 1922. July. pp. 151.

The chief interest of this work lies in the efforts on the part of the author to show that leprosy is distinctly a curable disease and that the conviction of its incurability has reacted disastrously not only on patients but also on medical men. The main reasons given for his belief in its curability are: (1) that cases of spontaneous cure occur, the only treatment being good food, baths, and open air exercise, especially on horseback; (2) that improvement follows removal from an endemic area, and cure results if the rules of hygiene are obeyed, and "appropriate therapeutic agents are employed"; and (3) that at sundry times and in divers places cure has been seen to result from a severe attack of smallpox and repeated attacks of erysipelas.

Of drugs which have been reputed to bring about a cure he mentions more than a hundred (itself evidence that none have proved effectual), but thinks that chaulmoogra is the most satisfactory.

The statements throughout appear to be based on the mere "ipse dixit" of others, and, with the exception of the use of chaulmoogra, no cases are cited. In this instance, however, details of four patients are given, but in none was cure effected, owing, says the author, to the time of treatment being too short.

H. Harold Scott.

PADUA (R. G.). **Observations on Some of the More Recent Work regarding the Chemotherapeutics of Chaulmoogra Oil Derivatives.** —*Monthly Bull. Philippine Health Service.* 1922. Apr. Vol. 2. No. 4. pp. 105–112.

This paper is the report of a visit to see the work on leprosy treatment by WALKER in California and the treatment trials carried out at the

Kalihi Hospital in Honolulu. The well-known work of the American investigators is described, and it is stated that DEAN and WRENSALL found indications in chaulmoogra oil of a hypothetical more highly saturated fatty acid than chaulmoogric acid, designated Taraktogenic acid, but have not isolated it, and that WALKER is still studying the action of ethyl ester chaulmoograte in tubercular disease in animals, and also the bacteriology of leprosy. At the Kalihi Hospital clinical trials are proceeding in both in-patients and those on parole after three successive monthly negative bacteriological reports. These are kept under regular observation for two or three years before final release, opinion still being reserved as to whether complete cures can be obtained, although further advances may result from continued research on the present lines.

L. R.

VAN GAASBEEK (C. B.). **A Report on the Use of Chaulmoogra Oil Derivatives in Leprosy.**—*U.S. Nav. Med. Bull.* 1923. Jan. Vol. 18. No. 1. pp. 50–56.

This is a brief account of the use of ethyl ester chaulmoograte intramuscularly in the leper colony of St. Croix and Virgin Islands. Of 72 patients only 37 accepted the treatment, the rest serving as controls, with the result that every one of the 23 treated cases with lepra bacilli in their nasal discharge became negative in this respect; but so did 15 of 23 untreated cases. The effects on the nodules in 10 cases of from 1–9 years' duration were remarkable, all improving materially, and in 7 the lesions all disappeared, although none of the 12 similar control cases improved at all, and 4 became worse. Equally striking effects were obtained in the treated anaesthetic cases, except that not much improvement of ulcers took place, apparently on account of secondary infections. Cases of under 5 years' duration did best, but improvement was quite marked in those of up to 10 years, and 4 of the treated (but none of the untreated) have been paroled. Of the treated cases, 80 have improved, against none of the untreated; the beneficial effects being thus undoubted.

L. R.

HARPER (Philip). **The Treatment of Leprosy by the Intravenous Injection of Chaulmoogra Oil.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 1. Vol. 26. No. 1. pp. 7–8.

In July, 1921, a report on 37 cases of leprosy treated by intravenous injections of chaulmoogra oil showed that 28 had improved, 6 were stationary, and 3 worse. The effects of two years' treatment are now recorded, including the discharge of 5 cases from the asylum. Five have improved further, 12 are unchanged, and 15 are worse, in considering which it must be borne in mind that 26 were nodular, mostly very advanced and desperate cases. Altogether 265 cases have received from a few weeks to two years' treatment, 40,000 intravenous injections having been given without serious mishap; 11 (5 very aged) have died, 28 are improved, including 15 discharged, 195 are unchanged, and 31 are worse. Other forms of treatment have given even less satisfactory results, tartar emetic intravenously having proved useless, and, contrary to the experience of others, in a small number of cases treated respectively with moogrol, sodium hydnocarpate or sodium morrhuate no benefit accrued [see this *Bulletin*, Vol. 17, p. 280; Vol. 19, p. 395].

L. R.

MATTA (Bernadino) & DEVOTO (Alberto). **La terapia della Lepra con i preparati cuprici.** [The Treatment of Leprosy with Preparations of Copper.]—*Ann. di Med. Nav. e Colon.* 1922. Year 28. Mar.–Apr. Vol. 1. Nos. 3–4. pp. 121–134.

Two preparations of copper were employed in this investigation, namely, cuprocyan, a double cyanide of potassium and copper, and cuproiodase, a liquid compound of copper, iodine, and cholesterin in an oily menstruum.

The former was administered intravenously, beginning with 5 cc. and increasing to 7·5 cc. at the third injection; these doses were injected at weekly intervals. At the fifth the dose was raised to 10 cc. and the interval increased to 14 days. The course consisted of 30 injections, repeated after a short interval.

Cuproiodase was used either locally or intramuscularly. For the latter the dose was 2 cc. (containing 3 mgm. of copper and 8 cgm. of iodine) injected into the gluteal region every other day. For local use 50 cc. was employed daily on gauze soaked in the preparation which contained 0·15 per cent. of copper and 5 per cent. of iodine. In some cases 1 per cent. methyl salicylate was added, with a view to setting up slight irritation of the tissues. For perforating ulcers of the foot cuproiodase and ether in equal parts was introduced on strips of gauze dipped into the mixture.

The first injection of cuprocyan intravenously in many cases produced some degree of dyspnoea and acceleration of the pulse, but this rarely lasted for more than a minute, and tolerance was rapidly established.

Twenty cases in all were treated, between the ages of 25 and 55 years; 10 were nodular leprosy, 5 anaesthetic, and 5 mixed. Great improvement was noted both in the local manifestations and in the general condition; but those treated with cuprocyan showed a return of symptoms about a month after the termination of the course. Those with ulcerative forms, treated locally with cuproiodase, improved very rapidly.

Histological examination of lepromata before, during and after treatment showed that as the cure proceeded the plasma cells, lepra cells and bacilli diminished in number, chromatolysis was more and more marked, the bacilli became more granular and lost their staining characters, and there was a tendency to an increase in the connective tissue whereby "the granuloma lost its characteristic appearance and assumed a more fibrous aspect." These changes were noticed both in cases treated by cuprocyan alone intravenously, and in those who were treated with cuproiodase as well.

The authors claim that the results are quite equal to those obtained with chaulmoogra and that treatment with copper salts is well worth further study.

H. Harold Scott.

VALVERDE (Belmiro). **Nota sobre um novo agente therapeutico contra a lepra.** [A New Drug for the Treatment of Leprosy.]—*Brazil Medico.* 1922. Dec. 2. Year 36. Vol. 2. No. 48. pp. 353–355.

On the analogy of the employment of copper compounds for tuberculous conditions the author prepared with the fatty acids of *Carpotroche braziliensis,* a colloidal copper compound which he uses in a concentration of 1 mgm. per cc., and upon the effects of which he reports very favourably. He has named the preparation " Carpotrochato cuprico." Four cases are detailed, on somewhat similar lines ; one may be given as an example.

A man (age not stated), who had suffered from leprosy for 15 years, came under treatment in 1915. He showed the mixed type of the disease. The face was leonine, with large and numerous lepromata, the body covered with maculae, and some anaesthetic patches were present. Treatment by injections of chaulmoogra oil for a year and a half, starting with 2 gm., with guaiacol and camphor, and increasing gradually to 6 gm., gave good results, and the patient thought he was cured, but in 1919, and again in 1921, fresh symptoms appeared. Chaulmoogra was again tried, but had to be given up as it caused shivering, fever, severe pain in the feet and legs, and intensification of the symptoms. Carpotrochato cuprico was then started. Twelve injections of 2 cc. were given and the dose was then gradually increased till at the time of writing the patient was receiving 5 cc. intravenously each day. The improvement both in local and general symptoms was very definite. [The site of injection of the earlier doses and the intervals between them are not stated in this case, but in another it was at first given intramuscularly and each day.]

The author does not claim that the drug will effect a cure, but that the amelioration is so definite that it is well worthy of further employment and study.

H. Harold Scott.

MAPLES (E. E.). **Some Notes on the Treatment and Diagnosis of Leprosy.**—*Nigeria Ann. Med. & San. Rep. for the Period 1919–1921.* pp. 33–34.

Weekly injections of tartar emetic intravenously have been given at the Calabar Native Hospital with unquestionable beneficial results, although it is certain that it does not cure if administered in doses consistent with safety. In the diagnosis of doubtful cases a nodule or macule may be punctured and stirred with a fairly large bore hypodermic needle, and a little exudate withdrawn in the syringe and stained for effective demonstration of lepra bacilli. Maples states that he commenced tartar emetic treatment in 1919 and claims priority for this method.

L. R.

VERSARI (Attilio). **L'antimonio nella cura della lepra.** [Antimony Treatment of Leprosy.]—*Riforma Medica.* 1923. Jan. 15. Vol. 39. No. 3. pp. 53–55.

Two cases of mixed leprosy, one of five years' duration, the other of seven years, are recorded. Previous treatment with nastin B and chaulmoogra oil had led to but little improvement.

Tartar emetic was injected intravenously. One per cent. solution was employed, the initial dose being 2 cc. Injections were given every three days, increasing by 1 cc. each time, to a maximum of 10 cc. The first patient received 15 injections, amounting to 90 cgm. in all, the second 22 injections, totalling 1·84 gm.

In each case the local manifestations showed a rapid amelioration, but no diminution in the number of bacteria could be made out on examination of blood smears obtained by puncture of local tubercles.

The author concludes, therefore, that the action of antimony is organotropic and not parasitotropic.

H. Harold Scott

JANIN (F.). **Traitement de la lèpre.**—*Rev. Méd. et Hyg. Trop.* 1922. Nov.–Dec. Vol. 14. No. 6. pp. 228–230.

Having obtained benefit in leprosy from the subcutaneous injection of serum from blisters raised over leprous lesions, the author tested whether the cantharides used in the irritant applied could be responsible for the results, and now records a trial of intramuscular injection of :—

Cantharidate of soda	0·01 gm.
Sulphate of atropine..	0·02 „
Distilled water	100 cc.

He begins with one-fourth and one-half cc. doses and works up to 1 cc. every other day for five or six doses, with a week's interval between each series of these, any irritation of the genito-urinary tract being controlled by the atropine. The effects were nearly immediate, appearing after two or three injections in improvement in the colour of macules and softening and decrease in the nodules, ulcers healed, pains decreased, and the general health improved "sous l'action du marveilleux tonique qu'est la cantharidine." Nephritis is not a contra-indication to the use of moderate doses, "remineralization" with "sea water" and arsenic being also indicated. No cases are given and the duration of the improvement is not recorded.

L. R.

i. BOULAY (A.) & LEGER (M.). **Recherches sur l'élimination du Calcium dans la Lèpre chez les Noirs.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 865–868.

ii. —— & ——. **Elimination du calcium et du phosphore chez les lépreux.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1002–1006.

i. In view of the decalcification of the phalanges, in anaesthetic leprosy more particularly, Boulay and Leger have investigated calcium metabolism in lepers. UNDERHILL, HONEIJ and BORGERT have recently recorded experiments indicating, contrary to what might be expected, a retention of calcium in lepers. In the earlier stages of two cases the authors found calcium retention in accordance with the observations of the American workers, but in one advanced case excessive excretion of this element.

ii. More frequent daily observations of calcium metabolism have confirmed the previous results, and the authors add observations on phosphorus metabolism showing simultaneous increased elimination of that element in the advanced leper, but of an intermittent nature with intervals of retention, and to a considerably less extent than that of the calcium.

L. R.

BOULAY (A.) & LEGER (M.). **La cholestérinémie chez les Lèpreux.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 57–59.

The authors have studied the cholesterin content of the blood in lepers, which MARCHAND had previously found to be decreased in three long-standing nodular cases, but normal in one early case. Two early and two advanced cases are reported on and MARCHAND's findings are corroborated. They then investigated the effects of injections of ethyl ester chaulmoogrates intramuscularly, and in the first two cases, in an early stage with good nutrition and showing calcium retention, six days after a course of five injections the blood cholesterine had increased from 0·90 gm. and 1·08 gm. to 1·80 and 1·47 respectively, but in one advanced case the cholesterine figures before and after the injections were 1·10 and 1·13 gm., showing no material increase.

L. R.

SERRA (Alberto). **Ricerche biologiche sull' infezione leprosa. Liquido cefala-rachidiano.** [Biological Researches on Leprosy. The Cerebrospinal Fluid.]—*Pathologica.* 1922. July 15. Vol. 14. No. 328. pp. 425–433.

The author quotes first the results of examination of the cerebrospinal fluid in leprous patients reported by JEANSELME, MILIAN, WEIL and TANON, who found no abnormalities in either tubercular, nervous or mixed forms. SLATINEAU obtained a positive Wassermann reaction with the fluid in six out of 21 cases.

Four cases are dealt with in the present paper: (1) a girl of 18, who had suffered from nodular leprosy for 10 years; (2) a woman of 61, with maculo-anaesthetic leprosy of 26 years' standing; (3) a woman of 60, with a similar condition for 13 years; (4) a man of 44, suffering from a mixed type, the disease having started 20 years previously. Attention was specially directed to the following points: the pressure of the fluid, the globulin and albumin content, the cell content, the presence of bacilli, agglutination tests, and the Wassermann reaction. Under the first four of these no noteworthy departure from the normal was met with. The agglutination reactions were too varied or indefinite for the drawing of any useful deductions. As antigens for the complement-fixation tests he used one or more of the following: (1) the filtrate (through a Berkefeld filter) of bacilli grown by the Campana method—on glucose-agar—from spinal puncture fluids, emulsified in distilled water and maintained at 40° C. for eight days; (2) an extract of leproma nodule; (3) extract of syphilitic liver; (4) extract of guinea-pig's heart.

The results of this test were peculiar. In the first case the blood-serum gave positive reactions with all the antigens, but less marked with the fourth, while the cerebrospinal fluid proved negative with all. In the second and third the sera were negative with all four, while the cerebrospinal fluids were positive with both the lepra antigens (Nos. 1 and 2). In the last case the serum yielded definitely positive results with the two lepra antigens, partially positive with the third (syphilitic liver), negative with the extract of guinea-pig's heart; the spinal fluid gave a weak positive with the first two, negative with the third and fourth antigens.

The author claims that his complement-fixation tests and the fact that the spinal fluid gave agglutination up to 1 : 50 in two cases prove the specificity of the bacillus isolated by him, and that the former reaction will serve to distinguish the nervous forms of leprosy from syringomyelia and Morvan's disease.

H. Harold Scott.

Zironi (Amilcare). **Sulla coltura del bacillo di Hansen.** [The Cultivation of Hansen's Bacillus.]—*Boll. d. Istituto Sieroterapico Milanese.* 1920. Dec. No. 6. pp. 381–395. [Received Oct. 16, 1922.]

From leprous nodules ground in a mortar in normal saline an organism was obtained by cultivation in Belfanti's glycerin-broth medium and by the Clegg-Duval method (broth inoculated with cholera vibrio). It proved to be a sporing organism ; many members were acid-fast, others had the typical arrangement of Hansen's bacillus but stained badly. As time progressed they all became less acid-fast, until this property was lost altogether. With Löffler's stain they showed irregular markings ; they were Gram-positive, would not grow aërobically, but only in partial anaërobiosis. Their pathogenicity for rats and guinea-pigs was little or none.

The author reviews the records of previous lepra bacillus cultivators —anaërobes, acid-fast pigmented and non-pigmented organisms, diphtheroids and streptothrices—and then discusses the significance of the one isolated by him. Owing to the failure to reproduce the disease in animals reliance has to be placed to a great extent on the morphology of the bacillus. He lays stress on the following points : (1) that the organism belongs to the mycobacteria ; (2) that in very recent lesions, where the organism is exhibiting intense reproduction, it is not always acid-fast ; (3) that in old foci the bacilli degenerate, lose altogether their acid-fast properties and take on the form described by Unna as Coccothrix ; (4) that they are often clubbed, with barred "diphtheroid" staining, and may show branching.

He next quotes Wherry's findings when growing the *B. tuberculosis* under unfavourable conditions, and states that the variations so resulting find an exact reproduction in the organism above described, and, finally, summarizes the question in these words : "Organisms such as those of Weil, Kedrowski, and Duval represent the parasitic stage of Hansen's bacillus : the diphtheroids and streptothrices are the saprophytic stage in which the organism acquires again its specific characters : that other parasitic forms cultivated may be a degenerative stage analogous to Wherry's cultures of Koch's bacillus or to the granular and streptococcal forms of Mircoli and Much, a stage in the normal development of the same organism."

In a terminal note the author states that, while this paper was in the press, he has isolated in pure culture from lepra nodules two diphtheroid organisms differing in certain characters both from each other and from that described above. All three he intends to deal with in a future communication treating of the pathogenicity of Hansen's bacillus and of the relationship between his organisms on serological lines.

H. Harold Scott.

i. ANDRIANI (S.). **Contributo allo studio delle alterazioni istologiche del fegato e della milza nella lebbra.** [Contribution to the Study of the Histological Changes in the Liver and Spleen in Leprosy.] —*Pathologica.* 1922. Apr. 15. Vol. 14. No. 322. pp. 221–230.

ii. ——. **Contributo alla conoscenza delle alterazioni istologiche del midollo spinale nella lebbra.** [Histological Changes in the Spinal Cord in Leprosy.]—*Giorn. Clin. Med.* 1923. Feb. 28. Vol. 4. No. 3. pp. 81–88.

i. Observations on the liver and spleen of a man of 53, who had contracted leprosy in South America 15 years previously and who died of pneumonia. The liver was enlarged, weighed 1 850 kgm., had a thickened capsule, was firm, granular, and of a reddish-yellow colour on section; the gall-bladder and ducts were normal. The spleen was also enlarged, weighing 830 gm., with a thick capsule, and, on section, showed whitish streaks.

Microscopically, sections of the liver showed large strands of connective tissue, in some places in islets or columns, in others encircling the lobules; in parts entirely replacing the parenchyma; elsewhere a few cells could be seen surviving in the midst of it. Similar connective tissue proliferation was noted in the portal systems surrounding the vessels and bile-ducts. There was increase also of the capsular fibrous tissue. The parenchyma appeared degenerated, the cells being vacuolated and the nuclei in many of them not visible; but where there was no increase of connective tissue they appeared normal. Large cells with two nuclei were seen; these the author regards as compensatory. Staining with Sudan III revealed droplets of fat in many of the cells. Ciaccio's method did not show lipoids. Lepra bacilli were noted in the intercellular spaces, scattered or in small masses, a few in the liver cells generally, but abundant in certain large vacuolated and vesicular-looking cells present in various situations and sometimes in considerable numbers. In sections stained by Gram's method, or with methyl violet, carbol thionin, or toluidine blue (but not with haematoxylin and eosin, or Van Gieson), certain spherical bodies, staining deeply and uniformly, and apparently homogeneous, "in size varying between that of a lymphocyte and a large mononuclear," were met with, singly or in groups. Sections of the spleen showed analogous changes—increase in connective tissue, rarefaction of the parenchymatous elements, homogeneous bodies in the connective tissue (in this case, however, staining with Van Gieson), and the vesicular cells. The reactions with Sudan III and by Ciaccio's method gave results similar to those found in the liver.

The cirrhotic condition of the liver partakes of the dual nature of the hypertrophic and atrophic forms.

After a résumé of the work of previous investigators, the author discusses the "spherical hyaline bodies"—whether they are merely plasma cells or some undifferentiated hyaline substance deposited in them, or whether, again, they are due to retrograde changes in these cells, and concludes that the second of these is the most probable.

ii. Full details of the results of examination of the cord from the same case are given, but the conditions noted, with one exception, were not in any way specific—increase in the meningeal connective tissue, lymphocytic infiltration, and such like—nor were lepra bacilli found, though the changes were most marked in the areas corresponding to those parts of the skin most affected in life. The author again found and describes the homogeneous spherical bodies, and discusses again their possible nature, but without coming to any very definite conclusion.

H. Harold Scott.

LAMA (Angel). **Notas sobre la epidemiologia de la lepra.** [On the Epidemiology of Leprosy.]—*Crónica Méd.-Quirurg. de la Habana.* 1922. June. Vol. 47. No. 6. pp. 633–637.

An expression of opinion that the transmitters of the lepra bacillus are, chiefly, *Sarcopsylla penetrans*, and, secondly, the *Sarcoptes scabiei*.

H. Harold Scott.

KUSUMBEKER (G. C.). **The Chaulmoogra Plant in Leprosy: an Ancient Remedy.** [Correspondence.].—*Lancet.* 1923. Feb. 3. p. 264.

DE LINT (J. G.). **Leproserieën.**—*Nederl. Tijdschr. v. Geneesk.* 1921. Jan. 1. 65th Year. 1st Half Vol. No. 1. pp. 53–62. [Historical.]

UCHIDA (Michitaro). [**Reports on the Experimental Rat Leprosy.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1922. Aug. No. 323. [Summarized in *Japan Med World.* Tokyo. 1922. Dec. 15. Vol. 2. No. 12. p. 354.]

TROPICAL OPHTHALMOLOGY.

STEINER (L.). **La Pigmentation de l'Epithelium Conjonctival et Cornéen.**—*Ann. d'oculistique.* 1923. Feb. Vol. 160. pp. 137–144. With 3 figs in text.

Steiner draws attention to the pigmentary changes in the conjunctival and corneal epithelium of coloured peoples, and comments on the fact that though these phenomena are familiar to workers in the tropics, they have been but little studied. Even the white races may show conjunctival pigmentation, and melanoblasts capable of producing such pigmentation are a constant feature of the histology of the European eye. In the dark races this pigmentation increases as age advances, and is most marked in those parts which are the most exposed to the action of daylight, being densest near the cornea and fading away toward the periphery of the eye; abnormally exposed portions of the conjunctiva (*e. g.*, those in everted lids) take on a deep stain in the tropics. Again, well-defined pigmentary stains on the conjunctiva can sometimes be shown to be identical with pigmented naevi. A third and important variety of pigmentation is found in the ring-like or irregular patches of dark discoloration seen in the subjects of granular ophthalmia. Under treatment, or during the spontaneous cure of the disease, masses of projecting granules are removed together with their contained pigment, whilst the colouring matter that lies in the hollows between the granulations often remains to give rise, as the whole conjunctiva flattens down, to the irregular patterns above referred to. It has been generally assumed that these pigmented markings with which we many of us are familiar are merely the result of the treatment employed. Steiner holds that this is incorrect, and bases his opinion on histological studies. [These observations are of the greatest interest and are doubtless in the main correct; but the reviewer is confident that some of the black masses, in India at least, in the conjunctivae of those who have undergone native treatment for granular ophthalmia, are due to the embedding in the tissues of the remedies employed; many of these are black in colour and are forcibly rubbed into the parts.]

Steiner further points out that the pigmentary changes associated with granular ophthalmia tend to get lighter or to disappear as the condition progresses towards cure. Pigment masses have been found in the tarsal conjunctiva where melanoblasts have not been shown to occur, but Steiner contends that though melanoblasts may be absent from this area in European eyes (on which their histology has in the past been worked out), it does not follow that the same holds true for the eyes of coloured races. Stained spots on the cornea, analogous in all respects to those found in the conjunctiva, have been observed by Steiner on two occasions and by others whom he quotes. The reviewer can bear out this observation, for he has certainly seen such spots on the opacified corneae of old severe cases of trachoma.

R. H. Elliot.

JUDD (Fred. H.). **Several Cases of a Rare Form of Subconjunctival Granuloma.**—*China Med. Jl.* 1922. Sept. Vol. 36. No. 5. pp. 397–399.

Judd gives notes of some further cases of the affection to which MCALL first drew attention [see this *Bulletin*, Vol. 18, p. 81]. These are accompanied by illustrations. He finds "that most cases seem to follow inflammation. In at least three of his five cases the non-affected eye was blind through inflammation; in three cases the condition followed inflammation, and in one case it followed traumatism." The operative result of one case seems to have been satisfactory.

R. H. E.

COPPINGER (W. V.). **Notes on a Case of Cataract in a Child following Lightning Stroke.**—*Indian Med. Gaz.* 1922. Dec. Vol. 57. No. 12. pp. 462–463. With 1 fig.

The outstanding point of interest in Coppinger's case is that the shape of the partial cataract (caused by the lightning stroke) strongly suggests that the opacity was the result of the direct exposure of the lens to the intense ultra-violet light of the flash, for it follows the curved line of the iris below and the straight line of the lid above.

R. H. E.

BECKER. **[Bilateral Total Cataract and Secondary Glaucoma after a Severe Electric Shock.]** *Heidelberg Ophthalm. Gesellsch.* 1920. Aug.

Becker's case of double cataract, following the shock of a 60,000-volt discharge, is of interest in connexion with the above record. Opacities appeared shortly after the injury and the cataracts were total in three and a half months. The rapid swelling of the lenses caused a secondary glaucoma similar to that so often seen in the intumescent cataracts of Eastern lands. Iridectomy relieved the tension and successful extractions were performed later.

R. H. E.

WRIGHT (R. E.). **The Importance of Radiography in Doubtful Cases of Optic Atrophy with Special Reference to Pituitary Disease.**—*Brit. Jl. Ophthalm.* 1923. Vol. 7. No. 3. pp. 123–138. With 5 figs & 6 charts.

Wright points out that unsuspected pituitary disease may often be the cause of optic atrophy which cannot be readily accounted for otherwise, and he emphasizes the importance of radiography in such cases. Clinical notes are given of five cases of the condition. The excellent photographs are by BARNARD. [The frequency of optic atrophy of obscure origin amongst tropical patients makes Wright's observations of great interest. The more we can cut up this large, little understood, group into well-diagnosed components, the better for all concerned.]

R. H. E.

BARTOLOTTA (E.). **Le cause della cecità in Libia.** [The Causes of Blindness in Libya.]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1920. June. Vol. 1. No. 6. pp. 265-267. With 3 text figs.

Visitors to Tripoli are astonished at the enormous numbers of blind and half-blind persons met with. Professor Bartolotta states that there are three main causes of this: first, small-pox; secondly, conjunctivitis associated with the Koch-Weekes bacillus; thirdly, quackery. The last is the most potent factor. Mild catarrhal conjunctivitis is treated by blistering in the region of the eye, and if the condition does not rapidly clear up the charlatans to whom the patients go do not hesitate to apply irritants within the lids and even actual cautery (" punte di fuoco ") not only to the palpebral but also to the ocular conjunctiva and to the cornea itself. Subsequent neglect does the rest.

H. Harold Scott.

DE RUYTER (J.). **Een nieuwe soort van exophthalmus.** *Geneesk. Tijdschr. v. Nederl.—Indië.* 1921. Vol. 61. No. 5. pp. 517-518.

The case is recorded of a man, 43 years of age, exhibiting marked exophthalmos with chemosis and oedema of the lower lid of each eye. The condition had persisted for four months, and the patient stated that he had had a similar attack seven months previously which had cleared up spontaneously. All the usual causes were excluded, and poisoning by paraphenylendiamine, which is sometimes used in hair-dyes and also for dyeing clothes and leather and causes these symptoms, could not be traced. Three similar cases occurred in Soerabai and Malang.

H. Harold Scott.

Vitrex Glass.

The announcement of a new form of glass (Vitrex) which, whilst cutting off the deleterious ultra-violet rays, hardly interferes at all with those which are strictly luminous, appears to mark an important advance in our search for an ideal glass for wear in the tropics. Professor CROOKES' discovery of the glass called after his name proved a great boon to sufferers from glare asthenopia, but even CROOKES' " A " glass has the disadvantage of possessing a slight mauve tint, which is objectionable from two points of view: (1) some patients complain of the shutting off of a certain amount of luminous rays thereby; and (2) some object to the notice which they assert that even the pale tint of the glass attracts. Vitrex is free from these objections, for it is a clear white glass; its claims to shut off ultra-violet rays are certified by such undoubted authorities as Sir Oliver LODGE, Dr. Judd LEWIS and Dr. Edridge GREEN; so that from the theoretical point of view they are very strongly supported. As the glass can be obtained of all spectacle makers, clinical tests of its value will not be long wanting, and excellent results may confidently be prophesied from its use in the glare of the tropics, of snow, or of any form of ultra-violet light, not forgetting that encountered in the taking of " movie " pictures. It is probable that before long neutral tinted glass of different depths of shade will be supplied by the Vitrex Company, so that we may hope to have clear Vitrex and various shades of neutral tinted Vitrex for our patients to choose from. This will be a great matter for tropical ophthalmologists.

R. H. E.

LOW (G. C.) & NEWHAM (H. B. G.). **Case of Trypanosomiasis from Portuguese East Africa Apparently Cured.**—*Brit. Med. Jl.* 1922. Jan. 21. pp. 96–97.

The case was one of infection by *T. rhodesiense* and was of about three years' duration. " He complained one day of the sight in one eye; he was examined by Col. R. H. Elliot, who reported that there was a patch of paracentral choroido-retinitis in the right eye, the condition, so far as we know, only twice before reported in human trypanosomiasis." The previous records are by COLLINS in a case of MANSON'S (1902), and by MORAX in 1910. It is of course well known that other eye symptoms are not uncommon in this disease, especially in the Rhodesian cases.* R. H. E.

CHARLES (E.). **Removal of Filaria from under the Conjunctiva.**—*Indian Med. Gaz.* 1920. Oct. Vol. 55. p. 378.

Charles removed what was presumably a filaria from a swelling on the inner lower aspects of the globe in a Hindu male, aged 45. The specimen was unfortunately spoilt by the method employed for preservation. It was stated to be a filaria, apparently a female, 33 mm. long by 2 mm. in diameter.

[The reviewer would take the opportunity of impressing on tropical surgeons the importance of the identification of all such zoological specimens. They should be placed at once in alcohol (70 to 85 per cent.) to which 5 to 10 per cent. glycerine has been added. The laboratories of the London School of Tropical Medicine (Endsleigh Gardens, London, N.W.1) will gladly examine such material and report upon it. A great deal of valuable material has been wasted for the want of proper handling, and the progress of knowledge has been considerably retarded thereby.] R. H. E.

PARODI (S. E.) & BONAVIA (L. L.). **[Filaria in the Eye.]**—*Semana Med.* 1920. Vol. xxvii, p. 543.

These observers removed a filaria from the right eye of a female, aged 62. The parasite was seen coiling and uncoiling itself beneath the conjunctiva. It had been causing irritation for four days. After removal it was found to be 11 mm. in length, and it kept up its movements for three days, at the end of which time it was placed in alcohol The examination of the blood for microfilariae yielded no results. The authors thought the parasite to belong to a species which had not previously been described. R. H. E.

BEGLE (Howell L.). **Infestation with** *Filaria loa*. **Report of a Case of Filaria beneath the Conjunctiva and Microfilariae in the Peripheral Blood Stream.**—*Jl. Amer. Med. Assoc.* 1921. May 7. Vol. 76. No. 19. pp. 1301–1305.

Begle states that there are nine or ten patients in the U.S.A. who harbour the *Loa loa*. Most of them seem to be missionaries returned from the West Coast of Africa. The symptoms, etc., of the condition and a number of other points are discussed. R. H. E.

FISCHER (W.). **Zur Kenntnis der Parasiten der Conjunctiva.** [Conjunctival Parasites.] *Cent. f. Allg. Path. u. Path. Anat.* 1919. Vol. 30. p. 226.

In an article on conjunctival parasites, Fischer refers to the organisms found in the conjunctival sac of man and the dog in China. The parasites are the same in both cases, except that those which infest man are the larger. He states that those removed from human eyes are probably identical with *Filaria lachrymalis* (Gurlt) and with *Filaria palpebralis* (Wilson); but he adds that accurate classification is quite impossible in the present state of our knowledge of the subject.

---

* *e.g.*, interstitial keratitis. A case in which this symptom was observed was noticed in this *Bulletin*, Vol. 20, p. 317, where it was overlooked that similar cases had been already reported [*loc. cit.*, Vol. 1, pp. 279 and 656].

R. H. E.

MOTAIS. [**Ocular Sparganosis.**]—*Ann. d'oculistique.* 1921. Vol. 158. p. 329.

Motais reports cases of sparganosis of the eyelids and orbit in a male, aged 25; both lower lids were oedematous and contained small tumour masses. Both orbits were also affected. The eyes had been red and the eyelids oedematous for years. By means of a Kroenlein resection he removed some of the parasites from the neighbourhood of the orbital wall, and then injected a solution of cyanide of mercury into the orbits on several occasions; neosalvarsan was also used.

In a child of 11 a diagnosis was arrived at from the presence of oedema accompanied by a tumour in one lower lid. An incision into the mass released a specimen of the parasite. The forms obtained in this way are larval and vary from 10 to 35 mm. in length, the head measures 2·5 mm. in breadth by 3 mm. in length, and the body is less than 2 mm. in breadth. The parasites obtained from the lid tumours are thus very much smaller than those originally described by MANSON; the latter were found beneath the peritoneum. The parent form is believed to be *Dibothriocephalus mansoni*, which occurs in the pig and dog in Japan, Africa, British Guiana, Tonkin, and Annam.

R. H. E.

CALDERÓN (Victor Manuel). **Contribucion al Estudio del Filárido onchocerca sp. Dr. Robles, 1915, y de las enfermedades que produce.** [*Filaria onchocerca.*] [Doctorate Thesis, 1919.]—107 pp. With 1 map & 35 other figs. 1920. June. Guatemala: Tipografia Sanchez & de Guise.

Calderón contributes a long paper on the subject of the disease onchocerciasis originally described by PACHECO-LUNA.

R. H. E.

PACHECO-LUNA (R.). **Onchocercosis.**—*Amer. Jl. Ophthalm.* 1921. Vol. 4. p. 175.

Pacheco-Luna returns to the subject of onchocerciasis, which he states to be endemic in a strip of land along the Pacific coast of Guatemala at an altitude of from 2,000 to 4,000 ft.; it is also believed to occur in the neighbouring regions of Mexico and San Salvador. He describes the ocular and other manifestations of the disease. He thinks the intermediary host is some blood-sucking insect, possibly a Glossina.* He advises that dwelling houses should be built in open places as far as possible from the banks of streams, and that they should be furnished with a good and safe water supply; the banks of streams in the neighbourhood of cultivated land should be cleared; lastly, he repeats his advice as to the removal by operation of the tumours containing the filariae. With regard to the nature of the parasite Pacheco-Luna believes that it belongs to a species hitherto undescribed.

R. H. E.

---

* This genus has not been found in the New World except in fossil form.

BEHR (Carl). **Ueber Ophthalmomyiasis interna und externa. (Die Fliegenlarvenerkrankung der Auges.)**—*Klin. Monatsbl. f. Augenheilk.* 1920. Vol. 64. pp. 161–180. With 3 text figs.

A boy of seven developed a circumscribed phlyctenule of the conjunctiva with swelling locally. Later, a scleral nodule developed followed by severe inflammation of the eye. The eye was removed on the suspicion of glioma or tuberculosis and the larva of a fly—believed to be *Hypoderma bovis*—was found. The retina was detached and there was intense choroiditis. The invasion of the human eye by this parasite is rare, and occurs in summer or early autumn, children alone being affected, the tougher sclera of adults resisting the passage of the worm. If the maggot enters the anterior chamber it can be easily diagnosed and extracted, whilst if it gets in further back the harm done is irreparable ; the last moment at which the eye can be saved is that in which the circumscribed phlyctenule it causes is replaced by the development of a scleral nodule ; the larva may then be extracted by the aid of an incision before it has had time to pass into the interior.

R. H. E

FÜLLEBORN (F.). **Nachtrag zu meiner Arbeit über Ophthalmomyiasis.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1920. Vol. 24. pp. 97 100. With 2 figs.

Fülleborn discusses the infection of the sheep's nostrils by the Oestridae, which he says takes place without the fly settling on their victims. In the Cape Verde group the Oestrus larvae are found in the eyes, pharynx and nose of the native as well as in the nostrils of sheep and goats. It is said that the natives of Sal endeavour to protect themselves against these pests by smoking and chewing strong tobacco. The larvae are extracted from the human eye by operation, whilst those in the pharynx are said to be treated with hot oil and highly spiced foods.

R. H. E.

PRATES (Manuel Maximo). **La myiase oculaire de l'île de Sal (Archipel du Cap Vert).**—*Bull. Soc. Path. Exot.* 1919. Dec. 10. Vol. 12. pp. 736–740. With 1 fig.

Prates traces the cases of human ophthalmomyiasis in the Cape Verde Islands to *Rhinoestrus nasalis*, an equine parasite, or to *Oestrus nasalis*, which is parasitic on goats and sheep. The former fly while in flight can deposit anything up to 50 eggs on the eye of a horse, mule, or donkey, and may accidentally do the same thing in a human eye. The latter fly deposits its larvae in the eyes of its victims, and only accidentally invades those of men and dogs.

R. H. E.

TICHO (A.). **Ophthalmomyiasis.**—*Brit. Jl. Ophthalm.* 1923. Apr. Vol. 7. No. 4. pp. 177–182.

In all six of Ticho's cases the larvae lay in the conjunctival sac and outside the tissues of the eye. He furnishes strong confirmatory evidence in support of the view that the mother fly deposits her larvae in the eye by flying against it. In three out of the six the flies would appear to have belonged to the Oestridae. The general question of maggot infection is discussed, and stress is laid on the fact that, whilst the anterior chamber tolerates the larvae well, an invasion of the posterior segment of the eye is fatal to the retention of sight.

R. H. E.

BULL (Lionel B.). **Habronemic Conjunctivitis in Man producing a "Bung Eye."**—*Med. Jl. Australia.* 1922. Oct. 28. 9th Year. Vol. 2. No. 18. pp. 499–500.

"Bung eye" is well known in Australia, and is also familiar to workers in the tropics, who have hitherto attributed it to the inflammatory oedema produced in the loose tissue of the lids, by the stings of poisonous insects. Bull suggests that some of the cases may be due to the invasion of the tissues by a larval nematode, belonging to one or other of three species of the genus *Habronema,* which in the adult stage are parasites in the stomach of the horse. The embryoes of these worms, still enclosed in the egg shell, pass out along with the faeces, and are liable to be taken up by fly larvae feeding thereon. The nematode larva undergoes changes within the fly and is deposited by the proboscis of that animal on the exposed mucous membranes of the horse, where it produces a granulomatous condition of a characteristic nature. After a time the spaces (or worm canals) occupied by the larvae and the larvae themselves disappear, the granuloma alone being left. In the case recorded by Bull a characteristic granuloma was found under the upper lid of a child, who, five weeks previously, had suffered from "bung eye"; and he suggests that the invasion of the human conjunctiva by the larval Habronema may be responsible for some of the cases of "bung eye," which are so commonly met with in Australia. The suggestion is valuable and promising, and may prove to apply to tropical as well as to Australian practice.

R. H. E.

SUEMORI. [**Ocular Tumour due to Lung Distoma.**]—*Nippon Gank. Zasshi.* 1920. Feb.

Suemori has investigated the tumours in the lids and orbits of animals infected by the lung distoma. He found that when specimens of distoma were placed in the conjunctival sac, they reached the uveal tract, lids, and orbits by direct entry through the vessels which perforate the eye from the conjunctiva. Having reached their destination they set up their characteristic lesions.

R. H. E.

MAZZA (A.) & TISCORNIA (S.). [**Subconjunctival Cysticercus.**]—*La Prenza Med. Argent.* 1920. Sept. 10.

These writers report the removal of a cysticercus from the subconjunctival tissues of the lower fornix in a girl of 15. They state that cases of cysticercus are becoming increasingly frequent in the Argentine, and it is therefore necessary for surgeons to be on the look out for them. It is of interest to record that both UHTHOFF and PILLAT reported an increased number of cases of cysticercus during the war, as a result of faulty meat inspection.

R. H. E.

EGYPT. Ministry of the Interior, Department of Public Health. **Eighth Annual Report of the Ophthalmic Section, 1920, by the Director of Ophthalmic Hospitals.** [MACCALLAN (A. F.).] 39 pp. With 5 charts & 5 plates. 1921. Cairo: Government Press. [Price P.T. 20.]

The annual report for 1920 of the Ophthalmic Section of the Egyptian Public Health Department (by Dr. A. F. MacCallan) must necessarily be of special interest, since it deals with a very large number of eye cases. Over 108,000 patients were examined during the period under review.

In Egypt, where nearly 75 per cent. of all cases of blindness are stated to be due to inflammatory conditions of the conjunctiva, and where between 90 and 95 per cent. of the population are said to show evidence of trachoma, conjunctival affections naturally attract most attention. Trachoma is said to be a much less dangerous disease than the more acute infections. The use of a lotion of eusol solution, combined with the application of 2 per cent. nitrate of silver, forms the routine treatment for acute conjunctival inflammations. From 8 a.m. to 3 p.m. the eyes are continuously bathed with the lotion by the patient, whilst, in addition, a hospital attendant swabs the patient's eyes at intervals of half an hour. No mention is made of the use of eyebaths of a saturated solution of magnesium sulphate in the treatment of these conditions. The eusol solution is freshly made of active eupad powder and ordinary water (2½ per cent.). The solution is shaken up in a demijohn from time to time for 24 hours and is then filtered through cotton wool.

It is interesting to note that, although gonococcal infections of the conjunctiva are so common in Egypt, ophthalmia neonatorum is stated to be rare.

Corneal ulceration occurred in 27 per cent. of cases of gonococcal infection, in 15 per cent. of Koch-Weeks infection, and in 22 per cent. of Morax-Axenfeld infection. Pneumococcal infection caused the highest percentage of ulceration, viz., 33·5. The report contains charts which show a remarkable correspondence between the rise of atmospheric temperature in the spring and summer and the number of cases requiring treatment for gonorrhoeal and Koch-Weeks ophthalmias.

Only 518 cases of trachoma were treated by Heisrath's combined excision as compared with 8,952 treated by scraping and expression.

More than 2,000 cases of glaucoma were met with, and 735 of these were operated upon. Sclero-corneal trephining was the operation of election. One case of late infection was met with. This occurred in an eye which had been trephined 16 months previously; the hypopyon quickly disappeared under treatment by Dr. BARSOUM, and the patient regained useful vision. The fact that only one case of late infection was met with in Egypt, where such a large number of patients have been trephined for glaucoma and where septic conditions of the conjunctiva are so frequent, is strong evidence that this complication is not necessarily so common as it has been stated to be by some surgeons, always provided that the operation is performed skilfully and in accordance with the rules laid down by the author of the procedure.

Optic atrophy is stated to be common in Egypt. The type is mostly post-neuritic.

The work of the Laboratory of Ophthalmic Pathology was extended during the year, and 397 examinations, exclusive of bacteriological examinations, were made. An interesting case of palpebral sporotrichosis is reported by the pathologist, Dr. SOBHY Bey.

Much useful work is being done by the ophthalmic clinics which have been established at the government primary schools.

The Director and his staff may well be congratulated on the good work shown in the report.

R. H. E.

EGYPT. Ministry of the Interior, Department of Public Health. **Ninth Annual Report of the Ophthalmic Section, 1921, by the Director of Ophthalmic Hospitals.** [MACCALLAN (A. F.).]—29 pp. With 5 charts: 1922. Cairo: Government Press. [Price P.T. 15.]

The ninth annual report of the Ophthalmic Section of the Egyptian Department of Public Health follows much the same lines as that of the previous year.

One hundred and thirteen thousand patients were treated during the year, and 65,000 operations were performed. The work of the hospitals is thus seen to be increasing steadily.

The dangerous character of the acute inflammations of the conjunctiva met with in Egypt is shown by the fact that, out of 14,540 cases of acute ophthalmia treated during the year, 25 per cent. came to hospital with ulceration of the cornea already developed. The organisms responsible, in order of their frequency, were the pneumococcus, the gonococcus, Morax-Axenfeld bacillus, and the Koch-Weeks bacillus.

The frequent occurrence of optic atrophy in Egypt has been already noted, and investigations as to the nature of the affection were undertaken during the year. It was found that post-neuritic atrophy was the commonest condition, and next to this, an atrophy following on a retrobulbar neuritis. These findings correspond with those of Kirkpatrick's work in the Madras Ophthalmic Hospital.

Out of a total of 127,223 patients who presented themselves for treatment during the year 2,254 showed signs of glaucoma. About 75 per cent. of these had postponed coming to hospital until they were already blind in one or both eyes. Elliot's trephining, with a 1½ mm. Bronner's trephine, was the operation of election in uncomplicated chronic glaucoma. It is stated that trephining is not advisable in cases in which there is an opacity of the lens, on account of difficulty when the time comes to do an extraction. [This complication does not, however, constitute a contraindication to trephining in chronic glaucoma; it is quite easy to make a corneal section when performing the cataract extraction, and the filtration area can in this way be avoided.]

It may be noted that it is the custom to perform prophylactic trephining; so that, when unmistakable glaucoma is present in one eye, operation is advised for the other eye, even though there are no clinical signs of glaucoma in it. This is a good rule in tropical practice, in which many of the patients can never hope to return to seek an expert's advice.

R. H. E.

OPHTHALMOLOGICAL SOCIETY OF EGYPT.—*Bulletin of 1921.* 1921. Cairo.

The Bulletin of the Society contains a record of the communications made to the annual general meeting and of the discussions which took place upon them. The papers published furnish ample evidence that the society is very much alive and that ophthalmology in Egypt continues to be progressive.

The most important paper is a report on the prophylaxis of trachoma and ophthalmia by a sub-committee of the society which was appointed at the annual general meeting in the previous year. Improvements in general and in personal hygiene, the teaching of elementary principles of hygiene in the schools, and a universal elementary education for boys and girls, are the measures of prophylaxis which appear most hopeful. Special stress is laid upon the importance of educating girls—the future mothers—regarding the mode of infection of trachoma and ophthalmia and the methods of preventing it. The committee also recommend propaganda by pamphlets, by preachers in mosques and churches, and by instructions read at public meetings. The fact that, in Egypt, 155,511 persons out of a population of 12,718,255 are blind in both eyes is eloquent testimony to the urgency of the problem. Acute ophthalmias appear to be a more important cause of complete blindness than trachoma is. Some stress is laid upon the rôle played by flies in the spread of infection.

Dr. SOBHI Bey contributes a paper upon the overlapping of the cornea by the sclera and emphasizes the importance of ascertaining the extent to which this is present before undertaking an intraocular operation—especially in the case of ELLIOT's sclero-corneal trephining.

Dr. CASSIMATIS writes regarding the therapeutic value of milk injections in cases of eye disease. His report is favourable; but he does not consider the treatment to be a panacea for every form of eye disease.

R. H. E.

HUDELLET (G.). **Notes d'Ophthalmologie.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Mar. & June. Vol. 2. Nos. 3 & 6. pp. 66–69; 173–176.

Hudellet prefaces his paper by drawing attention to the peculiarities of the heavy pigmentation of the Senegalese eye as compared with that of the European organ. In the case of the African native, it is especially necessary to employ oblique, or focal, illumination in order to detect abnormal conditions of the iris. Ophthalmoscopic examination, too, is rendered somewhat more difficult by the diminution of the red reflex, which is caused by the great quantity of pigment in the choroid. The macula differs much in appearance from that of the European; the pigmentation is in some cases so dense as to lead to its being mistaken for a pathological condition. An excessive overlapping of the cornea by the sclerotic was frequently observed; the author suggests that this is often the cause of an irregular astigmatism.

The natives of French West Africa were not found to possess that extreme acuity of vision which savage races are often stated to enjoy; this was accounted for in many cases by the presence of old corneal lesions. Their sense of colour vision, too, was more feeble than that found in more civilized races.

Trachoma and diseases of the optic nerve were the complaints most frequently met with. Cataract does not appear to be anything like so common as it is in India, and no mention of glaucoma is made in the paper. Optic neuritis and optic atrophy secondary to neuritis were the most common forms of nerve disease. The etiology of these conditions presented some difficulties; a positive Wassermann reaction was obtained in only 60 per cent. of the cases.

R. H. E.

BARGY (Maurice). **Statistique des cinq premières années de l'Institut ophthalmologique de Hanoi.**—*Bull. Soc. Méd.-Chirurg. Indo-chine.* 1921. July. Vol. 12. No. 1. pp. 90–99.

This paper contains the statistics of the diseases treated and of the operations performed, since the opening of the hospital in April 1916. The need for such an institution and the good quality of the work done are readily appreciated on reading the paper. The hospital is intended for a centre of ophthalmic teaching in Indo-China.

The most striking feature of the years 1917–20 is the very high proportion of trachoma to other diseases treated. During this period 16,625 operations were performed, and, of these, no fewer than 13,576 were for trachoma and its complications, 5,922 being for entropion. It is noticeable that, in spite of the prevalence of trachoma, only 7 cases of acute dacryocystitis were admitted during this period.

509 cases of senile cataract were admitted and 145 cases of glaucoma. Combined extraction was performed in the vast majority of cases of cataract.

R. H. E.

BARGY (M.). **Les injections parentérales de lait en thérapeutique oculaire.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1921. July. Vol. 12. No. 1. pp. 100–129.

Bargy reviews the different opinions expressed as to the efficacy of milk injections in ocular diseases since this form of treatment came into use in 1915. The consensus of opinion quoted is in favour of injections for the treatment of such diseases as affect the anterior segment of the eye, especially in infections of the conjunctiva and in gonorrheal iritis.

Bargy has used the treatment very extensively, but is unable, as yet, to form an opinion as to its true value in cases of disease of the posterior segment of the eye. He has, however, found it most efficient in those affections of the eye which are attended with conjunctival oedema and infiltration. Beyond the beneficial effect that it exerts upon the secondary infections, it has no value in the treatment of trachoma. It has been of great use in the treatment of gonorrhoeal ophthalmia and of corneal ulcer with hypopyon. The injections markedly relieve pain and photophobia, and diminish the amount of secretion.

The dose usually employed is one of 5 cc., but a smaller quantity is injected in the case of an invalid, a child, or an old person. It is essential to procure a febrile reaction, and, if the first dose fails in this respect, it is increased on subsequent occasions. An interval of two days is generally left between each injection. The milk is prepared by boiling it for ten minutes, and is again boiled for some minutes before the injection is made. It is best to make the injections intramuscular, as an extensive and painful local reaction is excited by a subcutaneous injection. The pain lasts for about twenty-four hours. The general reaction, with headache, fever and malaise, comes on from two to six hours after the injection. Care should be taken to avoid injection into a vein, since embolism might be caused in this way.

R. H. E.

TALBOT. **L'Institut Ophthalmologique Albert-Sarraut, à Hué, en 1921.**

This institution was founded in 1920 with the view of combating trachoma in Annam. The paper deals with the staff of the hospital, its administration, its expenses, and its statistics.

Trachoma furnishes 36 per cent. of the out-patients, 50 per cent. of the in-patients and 68 per cent. of the operations. It is in the schools that this disease can best be combated by (1) the inspection of the scholars; (2) the grouping of the infected, and (3) the application of suitable treatment. The co-operation of the scholars, and especially of the monitors, is cultivated. Trachoma ranks very easily first in Annam as a cause of blindness.

Gonococcal Conjunctivtis. As in other tropical contries, this form of conjunctivitis dose not follow European rules; it is often impossible to trace the venereal focus of infection; on the contrary, in July, August, and September the disease occurs with epidemic force year after year, resembling in this the other forms of acute conjunctivitis.

Ocular Sparganosis. Interesting cases of this only recently described malady are quoted. The larval parasite may be met with either under the bulbar conjunctiva or in the orbit, and may be found still alive, or dead and degenerate; an exact diagnosis is difficult until the mass is actually cut into; in the orbital cases the removal of the worm is followed by the happiest results; it is in these orbital cases that a differential diagnosis between sparganosis and sarcoma is so very important.

R. H. E.

FERNANDO (Antonio S.). **Causes of Blindness among Filipinos as observed in the Philippine General Hospital Dispensary—a Preliminary Report.**—*Arch. of Ophthalm.* 1922. July. Vol. 51. No. 4. pp. 374–378.

This report, with its statistical tables based upon 700 cases of blindness examined during the years 1920 and 1921, is of interest to all who are concerned with tropical ophthalmology and should be read in the original. It does not lend itself to abstraction.

R. H. E.

FERNANDO (Antonio S.). **A Brief Clinical Survey of Cases in the Free Dispensary of the Philippine General Hospital.**—*Arch. of Ophthalm.* 1923. March. Vol. 52. pp. 170.

The principal interest of Fernando's paper is that under difficult conditions in a tropical country he is endeavouring (1) to make a scientific classification of his ophthalmic material and (2) to organize and carry out team work. The figures speak for themselves and must be studied in the original; they are highly suggestive of those commonly met with in the East. Two small matters demand notice: (1) There is universal belief among the patients of the islands that glaucoma is caused by taking a bath after having stayed up late on the previous night or by sleeping with the hair wet. It is not impossible that with a people whose males wear their hair long the chill so engendered may be one of the exciting causes of attacks of glaucoma. (2) There is a custom of scratching the cornea over an embedded foreign body "with the tender end of the stalk of a certain kind of grass." Severe infection and extensive ulceration follow this crude procedure. The reviewer has had occasion from time to time to comment on the low standards with which tropical ophthalmologists sometimes confess themselves as satisfied, and he trusts that the high ideals and the scientific methods of working adopted by Dr. Fernando will be widely noted and followed.

R. H. E.

CHINA MEDICAL JOURNAL. 1922. July. Vol. 36. No. 4. pp. 364–369.—**Department of Ophthalmology. Abstract of Operative Clinic, held by Professor H. J. Howard and Dr. T. M. Li at the Ophthalmological Section, September 16th, 17th and 18th.**

In cataract extraction the use is advocated of a sclero-conjunctival suture, which is looped away from the field of operation, but pulled tight and tied as soon as the extraction is completed. It is especially recommended for troublesome patients.

A case of quinine amblyopia in a child aged 1 was met with after large doses of euquinine. Details are given, and the statement is made that "in severe cases of malaria, sometimes a dose of quinine sufficient to cause amblyopia is not sufficient to kill the parasite."

A complete tenotomy of the right inferior oblique for paresis of the left superior rectus met with great success. A complete tenotomy of the right inferior oblique for paralysis of the left superior rectus and spasm of the right inferior oblique was equally successful. These cases are of very decided interest, and are the more remarkable in that the bold and successful surgery recorded emanates from the tropics, where comparatively little opportunity for such work presents itself.

R. H. E.

MISCELLANEOUS.

NIGERIA. **Annual Report on the Medical Research Institute for the Years** (i) **1920 and** (ii) **1921.** [CONNAL (A.), Director.]—27 pp. and 14 pp. 1922. Lagos: Govt. Printer.

i. During 1920, the stools of 317 persons, including 195 Europeans, were examined, usually one specimen only. They were plated out on McConkey medium and the non-lactose fermenters further studied. On one occasion only was a typical Flexner bacillus isolated, and this patient had been during the war in a country where bacillary dysentery was prevalent. It is noted that a large number of the stools were received and plated within an hour. The European cases were arranged in four groups: in the first, of 25 in which the motions were liquid and contained mucus, 20 contained active *E. histolytica*, and in the third, solid motions with strings of mucus, 7 of 11; in the other groups, without mucus, this amoeba was much less common. In fact in 31 cases of acute dysentery *E. histolytica* was found in all but one. The writer contrasts the experience of BUTLER in Sierra Leone [see Sanitation Supplement, 1921, p. 141], who isolated a Flexner strain in 14 instances and Shiga in one, and *pace* BUTLER seems to attribute these findings to the fact that Sierra Leone supplied most of the carriers for the West African Forces in East Africa.

In the Annual Report for 1918 [see this *Bulletin*, Vol. 17, p. 219] an account was given of cases of amoebic dysentery treated with alcresta and emetine. Of nine in which there was apparent cure and the after history is known, eight have had no relapse.

Eleven patients treated for leprosy by gynocardate, as detailed in the Reports for 1918 and 1919, have shown no active sign since. Four active cases were treated with potassium cuprocyanide [see this *Bulletin*, Vol. 13, p. 5] for three months without improvement.

A number of house-flies were dissected and in a few instances found to contain cysts of *E. histolytica*. Other protozoa harboured were Herpetomonas, Cercomonas, Trichomonas and Eimeria. Of the last, found in a single fly, taken at a refuse heap, some description is given; it corresponds with none of the described species, *c.f.* Eimeria.

A table shows the nature of receptacles in which identified mosquito larvae were found during each of nine months; there are few receptacles against which *S. fasciata* does not figure, but the one preferred far above others is the waterpot, containing water from the nearest standpipe.

A case of actinomycosis of the omentum in a native is described.

Attempts were made to carry out the Wassermann test at the central laboratory. The blood or serum rarely arrived in a suitable condition, and it is inferred that, if a campaign against syphilis is to be waged, the test must be done at different stations in Nigeria or by travelling pathologists.

Some pages of this report are occupied by an account of 30 cases of blackwater fever, which will be noticed under that heading.

ii. In the Report for 1921 a synopsis is given of the development of *Loa loa* in Chrysops [see this *Bulletin*, Vol. 19, p. 654], and notes are added on the habits and life-history, which could not be traced beyond the larval stage, of the four species of Chrysops met with in Nigeria. In places 16 per cent. of natives are infected. Preventive measures consist in drainage to reduce the number of breeding-places and tree felling to remove shade, or alternatively the avoidance of infested areas in the selection of stations.

Four hundred and fifty-two samples of faeces were examined, 328 from Europeans, 124 from natives. In Europeans *E. histolytica* was present in the active or precystic stage in 51, as cysts in 16, 67 in all; 248 were negative. In natives *E. histolytica* was noted 24 and 16 times; 47 were negative. Helminth ova were more prevalent among the natives than the whites. Dysentery bacilli were specially sought but were never found, and in two suspicious cases the blood serum failed to agglutinate the stock laboratory culture.

Four lepers were treated with Moogrol. A weekly dose of 5 cc. was gradually reached. Their improvement, which was rapid, has so far been maintained.

Information is given about 26 cases of blackwater fever.

Dr. Connal speaks of the need for a physiologist to examine native poisons and drugs, and study the metabolic changes which occur in the local diseases.

A. G. B.

EAST AFRICA PROTECTORATE. **Annual Report of the Bacteriological Laboratory for the Year 1919.** [KAUNTZE (W. H.), Senior Bacteriologist.]—45 pp. With 1 plan and 2 charts. London: Waterlow & Sons, Printers.

The year's efforts were directed to the production of an efficient calf-lymph, a study of the Nairobi water-supply in consequence of a small epidemic of enteric, and the examination of soda-water prepared in the town.

The failure of the existing calf-lymph was due to its preparation in all stages in the open air, subjected to sun and dust, to absence of ice, collection from the calves at the wrong period and other errors of management. These matters were in course of remedy when instructions arrived from London advocating a Central Lymph Institute for Kenya and Uganda situated in Uganda. The author questions whether such lymph would be equally effective in the hot climate of Uganda and the cold of the Highlands of British East Africa, and notes that Dar-es-Salaam lymph is effective at Kampala but not at Nairobi. He states also that vaccination is sometimes effective in well-pocked persons and that second attacks of smallpox are not infrequent in East Africa, suggesting the existence of more than one strain of smallpox, which one strain of calf-lymph would fail to meet.

As regards malaria there was, coincident with the departure of military units, a decided fall in the number of benign tertian cases, from 308 in 1918 to 90 in 1919.

In the outbreak of typhoid practically all the cases yielded *B. typhosus* on cultivation of the blood, allowing a diagnosis in 48 hours. As well with mild as with severe cases it was the exception to obtain a positive Widal before the end of 14 days, and in some cases before the close of the third week [*cf.* this *Bulletin*, Vol. 19, p. 616]. In two cases each of paratyphoid A and B in natives, blood culture was unsuccessful but the Widal was positive.

Though the cause is not obvious, the number of dysentery stools sent for examination, and of cases in Nairobi, was much less than in the previous year. The prevalence of the bacillary type during the war has ceased, since this year only one bacillary case (Flexner) was found as against 32 of *E. histolytica*. No amoeba corresponding to *E. nana* was seen.

Attention is called to the prevalence of helminth infections and the need for further investigation. Bilharzia was found in natives living close to Nairobi, but so far the search for infected snails has been negative.

Several cases of fever occurred, with pyrexia of 3–4 weeks, undiagnosed; enteric and undulant fever were of course excluded.

Notes on the present accommodation at the Bacteriological Laboratory show that it is situated in a main artery of traffic where dust is constant, close to latrines where the excreta are exposed to the numerous flies, and with no accommodation for ice plant, and it is pointed out that re-erection on a fresh site is requisite.

The report opens with a cogent presentation of the economic value of a well-staffed and wisely used bacteriological laboratory in the tropics.

A. G. B.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH. **Annual Report for the Year ended 31st December, 1921.** [WATKINS-PITCHFORD (Wilfred), Director.]—47 pp. With 2 illustrations. 1922. Johannesburg: Published by the South African Institute for Medical Research, P.O. Box, 1038.

Research Division.—The antiscorbutic value of certain items of the native workers' dietary was investigated. Kafir beer, suitably prepared, was found to be equivalent in this respect to fresh milk. Germinated cow-peas if consumed raw had a definite value, whereas germinated soy-beans had little or none; pawpaws, naartjes (tangerine oranges) and oranges had well-marked antiscorbutic properties.

It having been asserted that workers in the copra industry do not suffer from *tuberculosis* and may recover if already affected, a guinea-pig was inoculated and treated by injections of coconut oil, without benefit. In a series of 47 cases treated after ROGERS' manner with morrhuate of soda, 19 were benefited and of these 7 showed "remarkable improvement."

Thirty-seven strains of *meningococcus* were investigated as to their type classification; 23 corresponded with Gordon's Type I and 3 with Gordon's Type II. No representative of Gordon's Types II and IV was met with.

Of 20 strains of pneumococcus obtained by lumbar puncture from cases of *pneumococcal meningitis* 15 were not classifiable into any recognized group and none came in group A. A few years ago group A was responsible for the majority of these infections and this change is regarded as evidence of the value of routine prophylactic inoculation with pneumococcal vaccine. Similarly, whereas from 70 to 75 per cent. of cases of lobar pneumonia were formerly assignable to groups A, B and C, it is now unusual to meet with these groups; pneumonia is now of broncho-pneumonic type and *B. influenzae* can be isolated from a large percentage of the lungs.

In an investigation of *tropical ulcer,* 73 cases, *B. fusiformis*—only occasionally associated with the spirillum—was almost constantly present. Excision and curetting were of no greater value than local treatment with novarsenobillon.

Three kinds of snails have now been convicted of harbouring cercariae of *Schistosoma mansoni* in S. Africa, viz., *Planorbis pfeifferi, Physopsis africana* and *Isidora tropica;* the author notes the adaptability of this cercaria. Experiments have proved that sexually mature adult tapeworms can be reared in experimental animals from cysts frozen solid for as long as eight weeks.

Routine Division.—The African native is commonly believed to be nearly or quite immune to *B. diphtheriae*, but organisms with morphological and staining characters typical for this bacillus were grown from a large number of throat swabs, as well as from nasal and conjunctival swabs, and when isolated in pure culture agreed with the specific bacillus. In many of the cases inflammation of the fauces, often with definite though scanty membrane, was noted, and cases which received specific treatment in the early stages got rapidly and completely well.

Examination in dysentery cases revealed *E. histolytica* in 51 instances and bacillary dysentery in 7 (Shiga in 2, Morgan's group in 5) ; many cases clinically diagnosed as dysentery were the subjects of flagellate diarrhoea.

As in the previous year [see this *Bulletin*, Vol. 19, p. 615] many cases of *enteric* fever failed to give a positive Widal's reaction, so that practitioners are urged not to set too great value on this serological test. Some puzzling cases gave agglutination with more than one member of the enterica group ; a well-marked agglutination with paratyphoid C was obtained twice.

As a result of 505 Weil-Felix agglutination tests, 212 of which were positive, it is pointed out that a larger proportion of true *typhus* cases in S. Africa fail to give this reaction than occurs elsewhere, and such high titres as elsewhere are not as a rule reached. Dr. PEARSON, of Kimberley, considers a 1 : 50 positive reaction as diagnostic of typhus. Reasons for the lack of sensitiveness of the test are suggested, of which the most significant seems to be the lack of local strains of X 19.

A. G. B.

ANNALES DE LA SOCIÉTÉ BELGE DE MÉDECINE TROPICALE. Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 165–173.—**Fonctionnement du Laboratoire de Léopoldville pendant l'année 1921.**

The number of examinations for sleeping sickness was 22,433, in the course of which glands were punctured 7,677 times, and the blood and cerebrospinal fluid examined 805 and 337 times. Of 119 infected persons 77 were diagnosed by gland puncture, and 42 by blood examination after centrifugation. Trial of various remedies for the disease showed that stibenyl is in no way superior to tartar emetic, nor silver salvarsan to arsenobenzol, and that sulfarsenol is superior to neosalvarsan only in that it can be conveniently given either by intramuscular or subcutaneous injection. In MARSHALL's method " the serum does not appear to have a trypanocidal action in the nerve centres, and does not promise amelioration of grave cases. It is certainly not the treatment of choice in sleeping sickness."

Of T.A.B. vaccine 7,500 doses were supplied, and stocks of 20,000 doses are kept on hand. In 1,222 examinations of faeces schistosome eggs were found 57 times, a considerable proportion with a terminal spur ; this affection is found only in extra-Leopoldville natives.

The Bordet-Wassermann reaction is positive in yaws in about the same proportion as in syphilis and is diagnostic of yaws in tertiary lesions when syphilis can be excluded. In each disease it may be difficult to render negative, and in yaws as in syphilis disappearance of cutaneous lesions is not synonymous with cure. Not only must recovery be tested by the B.W. reaction but this reaction must be renewed at intervals to make sure that the cure is permanent.

The authors have failed to inoculate the rabbit from smallpox lesions and have obtained only negative results with PAUL's corneal procedure [see this *Bulletin,* Vol. 19, p. 440], but have succeeded with NOGUCHI's test of inoculation into rabbit's testicles. Among patients treated for smallpox there were at least a sixth showing evidence of recent vaccination.

Six leprous patients were treated with injections of tartar emetic, a total of 2 gms., without benefit.

Hospital assistants and missionaries can obtain a course of instruction at this laboratory in the use of the microscope in the campaign against sleeping sickness and other infectious diseases. In 1921, besides 7 doctors, 3 sanitary inspectors and 24 missionaries availed themselves of this privilege.

A. G. B.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1921.** [FLETCHER (William), Acting Director, Government Laboratories, F.M.S.]—13 pp. Kuala Lumpur: F.M.S. Govt. Press. [Price not stated.]

This admirable report is largely occupied by an inquiry into the quinine treatment of malaria and an investigation of dysentery, which will be noticed in their appropriate places.

Melioidosis.—The history is sketched of the discovery of this glanders-like disease, formerly described under the names of pneumo-enteritis and pseudo-cholera, since it was recognized in Rangoon by WHITMORE in 1911 [see this *Bulletin,* Vol. 19, p. 617]. It is thought to be a natural disease of rodents conveyed to man by contamination of food with their excreta. A few cases were encountered in 1921; two, the first observed cases of recovery, were treated after 3 and 8 months respectively, the usual course being 10 days.

Venereal Disease.—GATÉ and PAPACOSTAS' formol-gel reaction for syphilis was tested with 1,193 specimens and compared with the Wassermann reaction. It was positive in 250 cases where the Wassermann was negative and negative in 92 cases where the Wassermann was positive. It is hence of no diagnostic value. Nearly 4,000 Wassermanns were done, but it was found that many of the specimens sent from a distance arrived in a condition unfit for testing.

Enteric Fever.—Of 518 agglutination tests the reaction was positive in 102 with *B. typhosus,* in 22 with *B. paratyphosus* B, in 7 with *B. paratyphosus* A, and in 22 with both typhoid and paratyphoid. Only two carriers of enteric organisms were detected during the routine examination of more than 1,000 cases of dysentery.

A. G. B.

MAURITIUS. **Report of the Bacteriological Laboratory for the Six Months ended 30th September, 1922.** [MOMPLÉ (F. J. R.), Ag. Govt. Bact. & Analyst.] [M.S. Report received from the Colonial Office.]

This report shows that 70 cases of enterica were diagnosed by agglutination and 4 by blood culture, that the diphtheria bacillus was isolated from 6 throat swabs, that of 196 samples of faeces, ova of trichocephalus were found in 111, of ankylostomes in 67 and of ascaris in 36, that of 90 urines microscopically examined Bilharzia ova were found in 18. Typhoid vaccine was made and 390 persons were vaccinated.

A. G. B.

HEINEMANN (H.). **Untersuchungen ueber den praktischen Wert der Meinickeschen Trübungsreaktion und der übrigen serodiagnostischen Methoden im tropischen Lande.** [The Practical Value of Meinicke's Flocculation Test and other Serodiagnostic Methods in the Tropics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 12. pp. 369–379.

The author has carried out about 7,000 serum tests by Wassermann, Meinicke, and Sachs-Georgi methods among the population of Java, and gives details (see table below) of a thousand of them. His purpose, however, is not so much to compare these different methods as to appraise the practical diagnostic value of any of them in ordinary tropical practice ; and his conclusion seems to be that in dealing with the elements of a native populace the results of serum diagnosis must be entertained with infinite caution, as they "have a value only in the frame of the entire clinical picture."

TABLE showing Serum Reactions of 1,000 Javanese coolies of both sexes by Wassermann and Meinicke Tests.

DIAGNOSIS.	W+ DM+ MTR+	W− DM− MTR−	W+ DM+ MTR−	W− DM− MTR+	W+ DM− MTR+	W− DM+ MTR−	W− DM+ MTR+	W+ DM− MTR−	Total.
Primary Syphilis	12	5	—	2	1	1	1	—	22
Secondary Syphilis ..	12	5	—	2	—	1	—	—	20
Tertiary	44	16	—	9	2	—	7	—	78
Secondary Yaws	28	8	1	—	1	—	2	—	40
Tertiary Yaws	25	8	—	1	3	—	3	—	40
Benign Tertian Malaria ..	5	24	—	1	1	—	1	2	34
Malignant Tertian Malaria	37	81	2	9	6	—	3	8	146
Quartan Malaria	—	—	—	—	—	—	1	—	1
Chronic Malaria	15	35	2	13	1	—	—	6	72
Fever "ohne Befund" ..	10	47	1	3	4	1	3	3	72
Ulcus Tropicum	6	30	—	3	—	—	1	—	40
Influenza and Pneumonia	17	45	2	7	1	—	2	—	74
Nihil	9	34	—	—	—	—	—	1	44
Gonorrhoea	4	16	—	5	—	—	2	—	27
Bubo	2	13	—	—	—	—	—	—	15
Staphylococcus	1	41	—	4	2	—	—	2	50
Other Miscellaneous Dis.	13	176	4	24	4	—	—	4	225
TOTAL	240	584	12	83	26	3	26	26	1,000

W=Wassermann. DM=Meinicke Flocculation Test.
MTR=Meinicke Trübungsreaktion.

A. A.

WEBB (W. Leslie). **The Original Sachs-Georgi Reaction in the Tropics as an Indication for Diagnosis and Treatment of Syphilis.**—*Jl. Roy. Army Med. Corps.* 1922. Aug. Vol. 39. No. 2. pp. 98–108.

During the year 1921 over 2,000 serums were tested by the Sachs-Georgi reaction at the Venereal Diseases Hospital at Mulago in Uganda, though less than half of them were controlled by comparison with the Wassermann reaction. The author describes his technique, tabulates his results, and states the following conclusions:—

"A comparison between the two tests as performed in the laboratory at Mulago leads to the following conclusions:—

"1. That the Sachs-Georgi reaction gives a considerably lower percentage of positive results in all cases of syphilis, including untreated cases, than the Wassermann reaction.

"2. That the two reactions agree in only 74 per cent. of cases, and that of the remaining 26 per cent. of cases 19 per cent. are positive to the Wassermann reaction and negative to the Sachs-Georgi reaction, and 7 per cent. are positive to the Sachs-Georgi reaction and negative to the Wassermann reaction.

"3. That the Sachs-Georgi reaction shows a very decided tendency to become negative as treatment progresses irrespective of the clinical condition of the patient and of the probability of his cure.

"4. That, consequently, the Sachs-Georgi test is not a reliable indication of cure in cases of primary and secondary syphilis.

"5. That a positive Sachs-Georgi reaction in cases of syphilis or suspected syphilis would appear to be as valuable as a positive Wassermann reaction as an indication for commencement or continuation of treatment, but that a negative Sachs-Georgi reaction is of very little value.

"6. The Sachs-Georgi reaction is more difficult to read than the Wassermann reaction, which leads to a high percentage of doubtful readings. In most of the results given the combined percentage of positive and doubtful Sachs-Georgi reactions corresponds very closely to the percentage of positive Wassermann reactions.

"7. That the Sachs-Georgi reaction appears to be as specific for syphilis as is the Wassermann reaction.

"8. That in spite of the obvious inferiority of the Sachs-Georgi reaction to the Wassermann reaction, it has a very useful application indeed in those tropical countries where it is difficult to perform the Wassermann reaction satisfactorily, and I strongly recommend its adoption as a routine diagnostic agent in these circumstances."

In the second section of the paper the author describes further experiments and their technique and tabulates the results of comparisons between the Sachs-Georgi reaction with Sachs-Georgi antigen and the same reaction with Bordet-Ruelen antigen, and of both of these with the Wassermann reaction. The following is a summary of results for the three reactions in active cases of secondary syphilis:—

	Serum.	Positive.	Doubtful.	Negative.
		per cent.	per cent.	per cent.
Sachs-Georgi with S.G. antigen ..	383	74	11	15
Sachs-Georgi with B.R. antigen ..	383	80	7	13
Sachs-Georgi with S.G. antigen ..	259	71	14	15
Wassermann	259	94	3·5	2·5
Sachs-Georgi with B.R. antigen ..	258	81	7	12
Wassermann	258	94	3	3

A. A.

DAWSON (A.) & SMITH (R. O. A.). **Comparison of the Wassermann Reaction with the Sachs-Georgi Reaction and with the Sigma Reaction of Dreyer and Ward.**—*Jl. Roy. Army Med. Corps.* 1923. Feb. Vol. 40. No. 2. pp. 128–132. With 1 text fig.

In 246 Sachs-Georgi tests the authors were fairly satisfied with the results until they got a negative result with seven sera which were clinically secondary syphilis and gave a strongly positive Wassermann reaction—possibly explicable by the fact that they were at that time putting up the S G test with only one dilution of serum and antigen. Of the 246 S G tests so conducted 85·4 per cent. were in agreement and 14·6 per cent. in disagreement with the Wassermann test.

Later, the authors have carried out 1,148 tests of 1,005 sera by the sigma test of DREYER and WARD, following in the main the technique described in the *Lancet* of May 7, 1921, and preparing the antigen by the formula of BORDET and RUELENS—chopping the heart into quarter-inch cubes, not mincing it. In reading the results they found that flocculation almost always increases after the usual seven hours, and occasionally might not be present after that interval but might occur later. Of the 1,148 Dreyer-Ward tests, 92·6 per cent. were in agreement and 7·4 per cent. in disagreement with the Wassermann test; and among these incongruities 2·52 per cent. were Dreyer-Ward negative to Wassermann positive, 4·09 per cent. Dreyer-Ward positive to Wassermann negative, and 0·78 per cent. Dreyer-Ward negative to a "partial" positive Wassermann.

The authors are of opinion that the Dreyer-Ward test is as reliable as the Wassermann in the diagnosis of syphilis; but it takes much more time to put up, and is tiresome and fatiguing to estimate.

A. A.

HAROLD (C. H. H.). **The Euglobulin Group and its Relationship to the Wassermann Reaction.**—*Jl. Roy. Army Med. Corps.* 1922. Aug. Vol. 39. No. 2. pp. 83–97.

The author, observing that the Wassermann substances due to malaria and syphilis come down in the globulin group and are to a certain extent capable of concentration without becoming unduly anti-complementary, planned a considerable series of differential precipitation experiments by various methods in order to determine the relation of the different precipitates to the Wassermann reaction. From these experiments, which are all fully recorded, he concludes that FRIEDEMANN's theories that the euglobulin group when precipitated by ammonium sulphate is anti-complementary, and that the positive Wassermann reaction is an intensification of anti-complementary powers, are untenable. His own conclusions from his own experiments are as follows:—

"1. The Wassermann bodies are solely contained in the euglobulin group and are capable of complete precipitation with this group by dilution acetic acid methods.

"2. The amount of precipitable euglobulin in syphilitic sera varies directly as the strength of the Wassermann reaction. This can be verified by opacity tests, estimation of bulk after centrifugalization and Kjeldhal estimations.

"3. As a test for syphilis dilution acetic acid methods have possibly a place in clinical medicine.

"4. By separation and concentration of the euglobulin group from a (+) serum (= 3 M.H.D. complement deviation) it has been possible to make a solution which with antigen deviates 12 M.H.D. of complement and is not anti-complementary.

"5. The Wassermann bodies are intimately bound up with the euglobulin group, but by careful treatment of a syphilitic serum with CO_2 and acetic acid it appears possible to separate out: (1) The main euglobulin group plus a fraction of Wassermann bodies; (2) a fine film of precipitate which has stronger deviating powers in proportion to its bulk than the whole euglobulin group and at the same time it is not anti-complementary.

"6. Precipitation methods employing ammonium sulphate do not lead to great concentration of the Wassermann bodies, but result in marked anti-complementariness with the higher saturations.

"7. The haemolytic bodies in haemolytic amboceptor, unlike the Wassermann bodies, are chiefly contained in the pseudoglobulin group.

"8. In malaria, under certain conditions, bodies may appear in serum which belong to the globulin group and react in the same way as the Wassermann bodies."

A. A.

DUBOIS (A.). **Séro-réaction syphilitique par le procédé Levaditi au Congo.**—*Ann. Soc. Belge de Trop. Med.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 249–252.

In the Congo there are many obstacles (*e.g.*, scarcity of guinea pigs) to the carrying out of the Bordet-Wassermann serum test in all its full and exacting technique. The author, having learnt that BRUCK's more simple method was inapplicable to Africa, since it gave a positive result in most blacks, was led to try, on a series of cases, the majority negroes, LEVADITI's test (HECHT's method), which makes use of the natural property of fresh human serum to haemolyse sheep's red corpuscles. Bordet's or Levaditi's antigen was employed. The serum to be tested was taken in the afternoon and examined the next morning (haemolytic properties persist for at least 48 hours at laboratory temperature). Three serum tubes were used according to the following scheme.

	Tube.	Saline.	Antigen.	Serum.	1½ hours at 37° C.	Sheep's redcorps. 5 pr. cnt.	Results. Positive Serum.
.. ..	1	0·2	0·1	0·1		0·1	No haemolysis 1
.. ..	2	0·1	0·2	0·1		0·1	No haemolysis 2
Control	3	0·3	—	0·1		0·1	Haemolysis .. 3

A negative serum would give haemolysis in all three tubes.

A serious fault was that, of 118 tests, 13 gave no haemolysis at all in the control tube (3), these serums lacking, apparently, haemolytic property.

The series of cases (118) included syphilis, yaws, tick fever, trypanosomiasis, leprosy, tropical ulcer, smallpox, malaria and certain pathological conditions of doubtful syphilitic origin.

The tabulated results of the test on these cases give considerable support to the author's claim that a *definitely* positive reaction is not obtained except in syphilis, yaws, and perhaps tick fever.

H. M. Hanschell.

DIACONO (Hector). **Séroréaction de la syphilis. Une nouvelle réaction au péréthynol par emploi du sérum de cobaye antimouton.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1922. June. Vol. 2. No. 2. pp. 219–226.

Being unable always to obtain pigs' serum, the author has used guinea-pigs' serum made haemolytic to sheeps' red corpuscles by injecting the latter into the guinea-pigs' peritoneal cavity according to RUBINSTEIN's method. This serum he has used, instead of pigs' serum, with the péréthynol. The author describes in detail his methods of preparing the reagents and his technique as applied to the test itself, and claims for this modification of the Vernes' reaction an increased simplicity, constancy, and certainty of results.

The Vernes' test is briefly as follows:—Péréthynol is an alcohol and ethylene dichloride extract of horse heart: this mixed with distilled water gives a colloidal suspension of a certain uniform opacity. When properly diluted this suspension gives varying degrees of flocculation with syphilitic serum, proportional to the intensity of infection; and no flocculation with a normal serum. The degree of flocculation is measured by adding pigs' serum. The pigs' serum prevents flocculation in a péréthynol-syphilitic-serum mixture, and in doing so loses its property to dissolve sheeps' red corpuscles. A strong positive reaction would therefore show no haemolysis and a negative reaction complete haemolysis with sheeps' red corpuscles. Recently Vernes has dispensed with pigs' serum and red corpuscles, and measures the flocculation directly by means of an "*opacimeter.*"

[Dr. Vernes "*Syphilimetry*" is reviewed in the *British Medical Journal*, May 5, 1923, wherein it is stated that the method does not command universal approval in France and has not yet been generally accepted by syphilologists and pathologists.]

H. M. Hanschell.

BRODEN (E.). **La réaction de B. G. Σ. dans les affections tropicales.** —*Bruxelles-Médical.* 1922. July. Year 2. No. 17. pp. 420–422.

The author employed the method (modified) of CALMETTE and MASSOL, as did in 1915 MATHIS and his collaborators [this *Bulletin*, Vol. 6, pp. 102, 130], who obtained negative results in cases of leprosy and malaria. He used the Bordet-Ruelens antigen from the Pasteur Institute of Brabant. He gives the notes of three cases of malaria, four of filariasis (*loa* and *perstans*), and three of sleeping sickness, all in Europeans and diagnosed by microscope. In no instance was deviation of the complement provoked.

A. G. B.

Fifth Congress of the Far Eastern Association of Tropical Medicine, to be held at Singapore, 3–17, 1923.—63 pp. With 2 plates. Printed at the Methodist Publishing House, Singapore.

The Far Eastern Association of Tropical Medicine was founded by the Americans in the Philippines, and its first Congress was held in 1910 in Manila, which has been a University town since the early Spanish days, 300 years ago. The second Congress was held in 1912, in Hongkong; the third in 1913, in Saigon; and the fourth in Batavia, in 1921. To the coming Congress this little book is a guide, containing not only technical instructions, but also useful information about Singapore, and about Malaya in general.

The Congress is to be constituted in four sections—Physiology, Pathology, Medicine and Surgery, and Hygiene. All members of the medical profession and workers in kindred branches of science will be welcome, on application to the Secretary, Dr. J. W. Scharff, at Singapore, and on payment of the subscription of 20 dollars. Papers from members unable to attend may be sent to be read by the Secretary, and should reach him on or before the 23rd July, 1923. Medical and surgical exhibits will be placed on view in the Congress Hall.

In contrast with Trengganu, one of the Protected Malay States, which has no railways or telegraphs and only ten miles of road, Singapore, the capital of the Straits Settlements, is furnished with all the apparatus of the most elegant European civilization. Those of its institutions that have a particular attraction for the medical profession are here described; they include the earliest (Chinese) hospital, built in 1844, by the generous Tan Tock Seng; the General Hospital – about to be translated to a modern building accommodating 825 beds; the Hospital for Women and Children, the Middleton Hospital for Infectious diseases, the Free Maternity Hospital, the Lunatic Asylum, sheltering over 400 male patients, the Central Sanitary Depôt, with its facilities for training sanitary inspectors, the Quarantine Station, capable of accommodating 5,000 native deck-passengers, and the King Edward VII College of Medicine, whose diploma is recognized by the General Medical Council of Great Britain.

A. A.

Angola. **Primeiro Congresso de Medicina Tropical da Africa Ocidental a realizar em Angola, na cidade de Loanda, nos dias 16 a 23 de Julho de 1923, sob o patrocinio e a presidência de honra de Sua Ex. O General José Mendes Ribeiro** Norton de Matos, **alto Comissário da República em Angola. Regulamento e Programa do Congresso, compreendendo o decreto no. 214, de 13 de Dezembro de 1922, a circular de convite pormenores de organização e outras informações de interesse para os congressistas.**—pp. 24. 1922. Loanda. Composto e impresso na Imprensa Nacional de Angola.

The Medical Services of Angola, Belgian Congo and French Equatorial Africa have resolved to have periodical reunions of the Medical Officers of the respective colonies, and it is announced that the First Congress of Tropical Medicine of West Africa will be held at St. Paul de Loanda in Angola in July 16–23, 1923. The Government of Angola will provide board and lodging for the delegates as well as transport from Lisbon or an African port. The President of the Council of Organization is Dr. A. Damas Mora, and the secretary, Dr. Germano Correia.

Application should be made to Repartição Superior de Saúde e Higiene de Angola, St. Paul de Loanda, *or* Agència Geral de Angola, Rua da Madalena, 237, 1o. Lisbonne.

A visit will be paid to St. Thomé and to the plateaux of Benguela and Mossamedes.

A. G. B.

DRUMMOND (J. C.) & ZILVA (S. S.). **Studies of the Nutritive Value of the Edible Oils and Fats. I. The Oil-bearing Seeds and Crude Vegetable Oils and Fats.**—*Jl. Soc. Chem. Industry.* 1922. Apr. 29. Vol. 41. 3 pp.

HARTENDORP (A. v. H.). **Some Results with Intelligence Tests in the Philippine Islands.**—*Philippine Jl. Sci.* 1922. Mar. Vol. 20. No. 3. pp. 287-307. With 8 charts.

VAN HEYNINGEN (A. Kits). **Beitrage zur Psychologie der primitiven Menschen.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 69-77.

HÖPPLI (R.). **Lungenveränderungen beim Kaninchen infolge Schimmelpilzinfektion.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Mar. Vol. 26. No. 3. p. 83.

KAMPMAN (A.). **Over de kreosootbehandeling van Influenza.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 27-30.

KEHRER (J. K. W.). **Twee gevallen van bloeding uit de lever.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 89-92.

KERNEIS & BAUJEAN. **Anemie pernicieuse chez une femme enciente.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Jan. Vol. 2. No. 1. pp. 24-28.

MÜLLER (H.) **Constitutiekenmerken bij het Maleische ras en Chineezen.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 1-19.

——. **Over een geval van Pneumatosis cystoides intestini in de tropen.**—*Tijdschr. v. Vergelijkende Geneesk., enz.* Leiden. 1923. Apr. 28. Vol. 8. No. 4. pp. 178-184. With 5 figs. [English summary p. 184.]

PAEZ (Félix R.). **Informe anual de la Direccion del Hospital Ruiz 1922.**—23 pp. 1923. Venezuela: Tip. La Empresa—Suegart, Cuidad Bolivar.

PILLAY (A. P.). **Treatment of Chronic Gonorrhoea. A Few Cases.**—*Indian Med. Gaz.* 1923. Feb. Vol. 58. No. 2. pp. 71-72.

WADE (H. W.). **On the Bacteriophage of d'Herelle.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. p. 195.

WIDAL (F.), ABRAMI (P.) & JOLTRAIN (Ed.). **Anaphylaxie à l'ipeca ; un cas d'eczéma par contact avec l'émétine ; un cas d'asthme par inhalation de poudre d'ipéca.**—*Presse Méd.* 1922. Apr. 22. Vol. 30. No. 32. pp. 341-344.

REVIEWS AND NOTICES.

The Practice of Medicine in the Tropics. By Many Authorities. Volume 3. Edited by BYAM (W.) [O.B.E.; Lieut.-Colonel, Royal Army Medical Corps (retired); etc.] and ARCHIBALD (R. G.) [D.S.O., M.D.Edin.; Major, Royal Army Medical Corps (retired); Director of the Wellcome Tropical Research Laboratories, Sudan Government, Gordon College, Khartoum; etc.].—xx + 1685–2550 pp. and index. Figs. 581–929; plates 67–96. 1923. London: Oxford Medical Publications. Henry Frowde and Hodder & Stoughton. [Price £4 4*s*.]

Section XI.—Helminthiasis (pp. 1685–1965).

This subject is very fully treated in some 270 pages. To *Schistosomiasis* are devoted 77, to *Ancylostomiasis* 30, to *Filariasis* 51, and to Hydatid-disease 11 pages. Clayton LANE contributes an introduction of 26 pages.

On looking through the classification of worms we marvel at the complexity of the subject—the *Necatorinae*, the *Necatoridi*, the *Necator*—the *Ascaridata*, the *Ascaroidea*, the *Ascaridae*, the *Ascaris*!

Has it come to this—that nobody can identify a mosquito, a tick, a worm or what not, except a few experts? We are afraid it is so. When again we look at the illustrations we find that practically all the old familiar pictures of *Taenia solium*, *Cysticercus cellulosae*, *Bothriocephalus latus*, *Ascaris lumbricoides* and the like have all gone, and we have, for example, "the axial portion of a proglottis reconstructed from serial sagittal sections," accompanied merely by a scale of *Diphyllobothrium stemmacephalum*. In fact, if this is a different species from *D. latum* we have no illustrations of the latter worm at all.

Our view is that this method—we suppose it is the method of helminthology—has been carried to excess, and we long to see a good picture of the actual worm in addition to that of an "imaginary specimen reconstructed from serial sagittal sections checked by comparison with serial transverse sections" of *Metagonimus yokogawai*.

We must, however, we fear, bow to the inevitable, recognise that we are old-fashioned and out of date; that we have here given us an account of parasitic worms which will well serve the purpose of several generations of those practising medicine in the tropics.

May we be forgiven one private grumble? Our ears still tingle with the impact of the horrid word "infestation"—"bestial infestations" they are called in one place—and we cannot yet reconcile ourselves to headings like "Trematode infestations other than haemal" and "Somatic infestations other than hydatid."

J. W. W. Stephens.

Section XII.—Diseases caused by Physical Agents (pp. 1967–1981).

Section XII contains a single chapter on "Heat-stroke" and "Sunstroke" from Professor W. J. R. SIMPSON, who writes with a full knowledge of the views of such authorities as FAYRER, MANSON, and ROGERS, and a no less intimate acquaintance with the more recent contributions of WILLCOX and others.

When considering treatment, the author notes that strychnine is contra-indicated owing to its tendency to cause convulsions. Cases have, however, been published comparatively recently in which hypodermic injection of this drug was included in the treatment successfully adopted. Much, doubtless depends, upon dosage.

Not long ago [*Brit. Med. Jl.*, 1920, June 12, pp. 795–6] an observer reported that in a series of cases occurring at Nasiriyeh vomiting was an invariable sign of recovery. This feature does not appear to have been included in the experience of other authorities, as it receives no mention here.

J. J. Pratt.

Section XIV.—Diseases of Doubtful Causation (pp. 2063–2272).

Section XIV, of over 100 pages, is devoted to the following 13 diseases:—Typhus, Rocky Mountain spotted fever, trench fever, the tsutsugamushi disease or Japanese river fever, Oroya fever, verruga peruviana, dengue, phlebotomus fever, imperfectly differentiated fevers of the tropics, rabies, smallpox, tick paralysis, goundou and sprue. If we take the last disease as an example, here, as in all diseases of doubtful causation, we are immediately faced by the question, How do we diagnose the condition ? In many cases there is a syndrome of symptoms which we may reasonably call sprue, but in many other cases we do not know whether we are entitled to call the condition sprue or not. We have, for instance, seen cases of so-called sprue, being treated with streptococcal vaccines and so forth, which did not appear to us to merit the diagnosis sprue at all. When from time to time in the literature we read of three-day fevers which last more than three days, and of seven-day fevers running an afebrile course ; of dengue with and without pains in the bones, with and without rash, with and without fever, of atypical dengues, of pseudo-dengues, of five or six-day fevers (why are there no four-day fevers ?), we then feel that we are well above terra firma and are exceedingly doubtful when we shall return there. These articles, however, provide us with the best means at our disposal for navigating these cloudy regions.

Goundou seems to be curiously placed in this list, for if goundou why not also ainhum and juxta-articular nodules, and especially why not influenza ?

Dengue, one of the most mysterious of diseases, is fully treated by CLELAND. We wish he had told us more of those devastating epidemics recorded in the past—or were these influenza ?—also that space could have been spared for the actual experimental evidence on which the transmission by *Stegomyia fasciata* is based. In the differential diagnosis twelve diseases are mentioned which may be confused with dengue, but we should not include malaria among these, for surely it is only the " Die-hards " who still diagnose malaria by the " typical rigor " and not by finding the parasites. Under treatment we find it stated that " Calcium chloride is useful when haemorrhages or urticaria occur." We would much like to know whether this is really true.

On page 2196 it is stated "that in many of these fevers reliance for their diagnosis and differentiation has been placed entirely upon clinical symptoms, a method of diagnosis notoriously uncertain and unscientific in fevers occurring in any climate, and especially in the tropics." This goes to the root of the whole evil. How can we differentiate A and B if we cannot recognise A and B when we see them, and when we do not even know whether A and B have any real existence !

If we ventured to express an opinion on the whole of this system of medicine, surely it would be a laudatory one. It has been a notable achievement.

J. W. W. Stephens.

Section XV.—Regional Diseases (pp. 2273–2319).

Section XV contains chapters on "Diarrhoea in the Tropics," "Ophthalmology " and " The Heart in Chronic Tropical Diseases."

Major John CUNNINGHAM, I.M.S., touches briefly and lightly upon the first of these subjects, with reference not so much to the diseases in which looseness of the bowels forms part of a syndrome as to those in which this condition, initially at any rate, constitutes the chief or only manifestation of diseased or disordered function.

Three pages are devoted to " Hill Diarrhoea," and it is worthy of note that the treatment still regarded as most satisfactory in its results is that recommended by CROMBIE thirty years ago.

In Chapter 106, " Ophthalmology," Lieut.-Colonel R. H. ELLIOT, I.M.S., compresses into the short space of 26 pages an individual contribution of conspicuous merit. The chapter specially recommends itself to tropical practitioners by the fact that it deals almost exclusively with diseases of the eye as seen in the native races which have provided the clinical material from which the author's unrivalled experience has in large measure been derived.

Colonel ELLIOT's views are set forth clearly and attractively and with marked descriptive power, and the reviewer is content to leave this chapter to the assured appreciation of its readers. The illustrations are good and include some beautiful coloured plates.

In Chapter 107 Dr. R. M. WILSON gives a short and interesting account of "Conditions of the Heart met with in Chronic Tropical Diseases." Organic disease in these cases is very rarely encountered. The chapter is illustrated with instructive sphygmographic tracings.

Section XVII.—Diseases of Women (pp. 2471–2498).

Section XVII is by Dr. Grace MACKINNON. After incidental references to the barbarous and septic ministrations of indigenous midwives, to the evils consequent upon early marriage, and to the imaginary influence of evil spirits and offended deities as etiological factors in disease, the author considers "climate conditions" affecting the production of the neurasthenic syndrome and the effect of hot climates on the advent of menstruation, the increase of menstrual flow, and the aggravation of menorrhagia or metrorrhagia.

The portion of the chapter which deals with the effects of malaria on the normal sexual functions of women, on pregnancy, the puerperium, and diseases peculiar to women provides good reading. The author lends the weight of her experience to exposure of the folly of the once widespread idea that quinine, even in moderate doses, is contra-indicated in pregnancy. The necessity, moreover, of giving the drug after childbirth in malarial subjects is wisely insisted on.

Osteomalacia, a disease almost limited to the female sex and most common in multiparous women, is frequent in parts of India, and is usually productive of such pelvic deformity as to make natural labour impossible. An excellent account of predisposing causes, treatment and prophylaxis is given, and the fact recorded that immediate arrest of the disease has followed the removal of both ovaries.

A short account is given of "Sutica," a fatal form of chronic diarrhoea occurring in puerperal women and frequently seen in Bengal.

Dr. MACKINNON's contribution is specially worthy of study by those proceeding to the tropics to take up appointments in connexion with hospitals for women. It must not, however, be regarded as in any way complete in itself.

Section XVIII.—Surgery (pp. 2499–2550).

Section XVIII is by Professor F. C. MADDEN, of Cairo. Like most surgeons of tropical experience, he favours chloroform, in the absence of special contra-indications, whenever a general anaesthetic is required. He has, however, for years past resorted, whenever possible, to spinal anaesthesia by stovain with great success. His experience is that in spite of the many adverse factors peculiar to hot climates and their inhabitants, tropical patients stand operations well, and that these can be quite successfully carried out.

The influence of malaria as a cause of conditions calling for surgical attention, as producing close simulations of many serious affections, and furnishing grave post-operative complications, is emphasized, and the surgeon advised to protect himself by a routine blood examination before operation.

The oral lesions of visceral Leishmaniasis and various forms of dermal Leishmaniasis are briefly referred to. It is interesting to learn that for some of the latter met with in Egypt and the Sudan the most satisfactory treatment is complete excision followed by skin-grafting.

In Egyptian splenomegaly, essentially a disease of malnutrition and non-malarial and non-parasitic in origin, excellent results follow splenectomy if undertaken at an early stage.

Of appendicostomy in the chronic diarrhoea of amoebiasis the author speaks without enthusiasm. To caecostomy, either open or valvular, in dysentery of either type he does not allude. Surgeons with experience of the treatment of hepatic abscess by aspiration and emetine will by no means concur in the dictum that this method is only likely to be successful when the collection of pus is quite small. The proved efficacy of the method introduced by ROGERS in abscesses of all sizes constitutes one of the most striking of recent advances in medicine.

Under filariasis the author describes the method of operation which he practises in removal of the elephantoid scrotum: most surgeons devise methods either wholly or partly their own. Surgery being generally regarded as of little avail in elephantiasis of the lower extremity, it is pleasing to read of improvement and relief following on Kondoleon's operation.

A clear and concise account is given of rhinoscleroma, a disease of which the author has considerable experience, but which hardly admits of surgical treatment.

The effect of spirochaetal infections, either primary or superimposed on bilharzial lesions in production of papillomatosis of the perineum and pudenda is described and illustrated, as is also another spirochaetal lesion, "Granuloma labiale."

Some well-illustrated pages are devoted to special features of surgery in the tropics.

Professor MADDEN's section will specially appeal to many readers on the same grounds as the chapter on "Ophthalmology," treating as it does almost entirely of diseases and conditions encountered among the native inhabitants of the country where the author's work has been carried on.

The high standard of excellence deservedly and fully acknowledged by the reviewers of the first and second volumes of this work in the *Tropical Diseases Bulletin*, Vol 19 (pp. 259 and 532), is well maintained in the sections now under notice.

J. J. Pratt.

PEKING. **Addresses and Papers, Dedication Ceremonies and Medical Conference, Peking Union Medical College, September 15–22, 1921.**—pp. xiv + 416. With various illustrations. 1922. Peking, China.

Something has already been said in this *Bulletin* (Vol. 18, p. 146) of the new Union Medical College of Peking; the present volume records the formal inauguration and dedication of the College.

It is to be understood that, like the tree Igdrasil, the College is new not in its root but in those substantial and umbrageous parts that give visible support and comfort to the present generation and settled hope for the future. Its root and its name go back to 1906, and its nameless radicle may be traced to 1861, when Dr. William LOCKHART, of the London Missionary Society, opened a dispensary for out-patients in Peking. All the outgrowth from LOCKHART's dispensary disappeared in the Boxer rising, and it was in 1906, when quiet had returned to Peking, that a replenished school of western medicine arose there from the united efforts of three British and three American Missionary Societies co-ordinated by Dr. Thomas COCHRANE of the L.M.S. This seminary, which received the significative name of Union Medical College, is now transformed, under the auspices of the Rockefeller Foundation, into the magnificent institution already described in these pages. The architectural features of the new college are Chinese, but its internal arrangements are after the latest western models; its educational scheme includes at one extreme the natural sciences preliminary and ancillary to the study of medicine, and at the other end the apparatus of what we call post-graduate instruction, besides providing the optional humanities of Christendom ; its design is to become a centre of enlightenment, and, through its hospital, a centre of medical research for China. As Dr. E. H. HUME reminded the assembly at the dedication ceremony, its purpose is anticipated in the words of Peter PARKER (1834), who was associated with Thomas COLLEDGE (1827), first European pioneer of medicine in China, in founding the Canton Medical Missionary Society " to educate Chinese youths in Western Medicine and to advance general medical knowledge by the reflex benefits which will accrue from scientific discoveries in China." The Rockefeller Foundation has defrayed all the rich cost of the new buildings, and has undertaken to provide the funds necessary for the maintenance of the institution until its future is assured ; but of the thirteen trustees who constitute its board of management six are severally representative of each of the six missionary societies connected with the original college.

A. Alcock.

DESTEFANO (Francisco) & VACCAREZZA (Raúl F.). **Poradenitis Inguinal Subaguda.**—Reprinted from *La Semana Médica.* 1923. No. 6. 198 pp. With 14 figs.

This work opens with a brief consideration of the question of the identity of the diseases spoken of as Subacute Inguinal Periadenitis, Climatic Bubo, Subacute Inguinal Lymphogranulomatosis, Fourth Venereal Disease, etc. Next follows a rapid historical survey and a study of the etiology of the condition. The disease is confined very largely to the male sex, and the majority of cases occur between the ages of 20 and 30 years, with a slight preponderance in the latter half of this period. Though much more common in tropical and sub-tropical regions it is not confined to hot climates. The superficial group of glands is primarily affected and the portal of entry of the hypothetic causal organism is some small abrasion or herpetiform or papular erosion of the external genitals. A description of the pathological anatomy of the affected glands, naked-eye and microscopic, is next presented, with illustrative microphotographs. The clinical aspect is fully dealt with, the general and local symptoms, the results of blood examinations, Wassermann reactions, and so forth. In three cases out of 23 tested the Wassermann reaction was positive " although there was no suspicion of syphilis." The diagnosis between it and other causes of glandular enlargement is discussed, especially plague (Pestis minor), tuberculosis and syphilis ; no mention is made of lymphadenoma.

Various methods of treatment are spoken of, but none of them has proved satisfactory except extirpation.

The last part of the work consists of very detailed accounts of twelve cases and a concluding summary of the subject We note in this that the authors state that " clinically the disease is characterized by a tendency to suppuration in successive foci." This has certainly not been the experience of the reviewer ; it is true that foci of softening occur, but, when incised in expectation of finding pus, in the majority of cases none is evacuated. In those recorded in detail in this book—twelve in all—pus is mentioned in half only and in some of these the quantity was very small: " minute foci " in one, " one cc " in another ; in only one instance was there 5 cc.

The work shows evidence of prolonged and careful investigation.

H. Harold Scott.

PHISALIX (Marie). **Alphonse Laveran : Sa vie, son oeuvre.**—268 pp. With 30 figs. and 3 plates. 1923. Paris : Masson et Cie, Libraires de l'Académie de Médecine, 120, Boulevard Saint-Germain (6e).

Alphonse LAVERAN was born in 1845 into a goodly medical heritage, his father, who himself was the son of a physician, being a much-distinguished military medical officer. At the age of 22 Alphonse followed his father into the army, and after serving in the disastrous war of 1870, and then for five years as assistant professor of military medicine at Val de Grâce, he was sent, in 1879, to Algeria, where in a year he made that discovery of the living malaria parasites which has placed him among the immortals of our profession. From 1884 to 1894 he was back at Val de Grâce as professor of military hygiene; and in 1896, "*incuriosus si quis alius famae*" in respect of public office, he retired from the service and betook himself to the Pasteur Institute of Paris to study, undistracted, the living foundations of pathology. There he worked long hours every day; and when, in 1907, as a recognition of his great discovery, he received a Nobel prize, he immediately gave it all away to establish a laboratory of tropical medicine, where he continued to work for the rest of his life.

Madame Phisalix gives us, besides these interesting particulars of LAVERAN's life, a very full account of his varied and extensive contributions to medicine and allied branches of science; his life was, as she says, a long laborious cult of knowledge—an austere and sustained devotion, interrupted only by the fell sergeant Death.

Some define genius as an infinite capacity for taking pains; some as the instinct for seeing aright what lies straight in front of the eyes; some as the inward spur that impels the clear spirit above the lure of earthly guerdons: by these tests LAVERAN is abundantly justified.

A. Alcock

PEARSON (A.) & MOUCHET (R.). **The Practical Hygiene of Native Compounds in Tropical Africa, being Notes from the Experience of the First Eighteen Years of European Work in the Katanga.**—pp. xiv + 188. With 44 plates. 1923. London: Baillière, Tindall & Cox. [Price 22s. 6*d*. net.]

This book will be noticed in Sanitation Supplement No. 2, to be issued in July. The reviewer writes that Doctors Pearson and Mouchet, as the result of many years' experience, have produced one of the few books of real practical value to medical men who have the care of native labourers in Tropical Africa.

Dr. Pearson most unfortunately lost his life on March 27 in assisting his native boy, who was gassed in a mealie pit.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 7.

"HAEMOGREGARINES" IN MAN, WITH NOTES ON SOME OTHER SUPPOSED PARASITES.

By C. M. WENYON,

Wellcome Bureau of Scientific Research. Sectional Editor, Tropical Diseases Bureau.

Haemogregarines as parasites of cold-blooded vertebrates have long been known as objects of interest in blood films of these animals. That they occurred also in mammals was first demonstrated by the discovery by BENTLEY (1905) and JAMES (1905), in India, of a haemogregarine in the leucocytes of the dog, and by BALFOUR (1905), in the Sudan, and LAVERAN (1905), in Tunis, of a similar parasite in the red blood corpuscles of the jerboa. BALFOUR also noted a haemogregarine in the leucocytes of the rat, while CHRISTOPHERS (1905) in India described a form in the red blood corpuscles of the gerbil. Since that time many other mammals have been found infected with leucocytic or red blood corpuscle haemogregarines and observers have been on the look out for these parasites in human beings. During the last few years a number of species have been described from man. It seems, therefore, a suitable opportunity to examine the characters of the undoubted haemogregarines of animals and to compare them with those of the recently described human parasites.

For some time the only stages of haemogregarines which were recognized were the well known elliptical or looped forms which occurred in the blood cells, though the researches of LABBÉ and others had shown that reproducing forms—schizonts which gave rise to a number of merozoites—sometimes occurred in these cells in the peripheral blood. Such forms were more commonly found, however, in the internal organs, either in red blood corpuscles or other cells. It is now generally known that haemogregarines reproduce asexually by schizogony either in red blood cells, endothelial cells of the blood vessels, or other cells of the internal organs of the vertebrate. When this occurs in the red blood cells or endothelial cells these cells containing schizonts occasionally appear in the peripheral blood and are found in ordinary blood films but most usually, like blood corpuscles infected with schizonts of *Plasmodium falciparum*, they are held up in the vessels of the organs. The forms which occur most frequently in the circulating cells are those which are destined for development in some invertebrate host. The researches of REICHENOW (1910, 1921) and NÖLLER (1913, 1920) have shown that these haemogregarines which appear in blood films may be either gametocytes or sporozoites.

In the case of certain forms (*Lankesterella*, *Schellackia*) the whole cycle takes place in the vertebrate and resembles that of a typical coccidium of the genus *Eimeria*. Sporozoites are finally produced and it is these which enter the red blood corpuscles. Without any further development they are handed on passively, by leeches in the case of *Lankesterella* of the frog, and by mites in the case of *Schellackia* of lizards, to another vertebrate host. In the case of other haemogregarines it is only the asexual cycle (schizogony) which occurs in the vertebrate, as in the case of malarial parasites, and when, finally, gametocytes are produced, these enter the circulating cells—in some cases red blood corpuscles, in others leucocytes. These gametocytes are then ingested by blood-sucking invertebrates and according to the course of the development of the oöcysts in these hosts the genera *Haemogregarina*, *Karyolysus* and *Hepatozoon* can be recognized. To the genus *Haemogregarina* belong the parasites of the water tortoises which are carried by leeches, to the genus *Karyolysus* certain parasites of lizards which are transmitted by mites, and to the genus *Hepatozoon* the parasites of the red blood corpuscles or leucocytes of mammals which are conveyed by ticks, mites, fleas or lice. In the case of the vast majority of haemogregarines, the only forms known are those which have been found in simple blood films, and in most instances these are gametocytes. The forms which appear in the peripheral blood of mammals (dogs, cats, jerboa, etc.) are always gametocytes. Schizonts occur only in the internal organs of these animals and have never been found in the blood stream.

As they occur in ordinary dried blood films—and it is these stages with which we are at present primarily concerned—the haemogregarines are of very uniform appearance though they differ considerably in size. There may be recognized three main types, all of which occur either in red blood corpuscles or leucocytes, enclosed in a membrane of varying thickness (Fig. 1).

1. *Long-looped forms.* These haemogregarines, of which the form in the tortoise is a good example, are elongate vermicules which are doubled within the enclosing membrane in the form of a U (Fig. 1 *e*). The two limbs, which are of equal length, are closely applied to one another and one of them is thicker than the other and has a blunt rounded end. The narrower limb tapers uniformly towards its extremity, which is also rounded. In the thicker limb occurs the nucleus, which is a dense mass of red-staining material occupying the whole width of the limb and is often longer than it is broad.

2. *Short-looped forms.* These forms are similar to those of Type 1, except that the narrow limb is short (Fig. 1 *f*). It may be half the length of the large limb or even smaller, and is often difficult to detect. The nucleus in the large limb is like that in Type 1.

3. *Forms without a loop.* These are sausage-shaped bodies which completely fill the membrane, and have no indication of a limb (Fig. 1 *a–d* and *g*). The nucleus is centrally placed and is a deeply-staining massive structure like that of the other types.

Though these three types can be recognized for purposes of description they are not sharply marked off from one another. Those of Type 3 are derived from the other types by gradual fusion of the two limbs or by a withdrawal of the smaller limb. It thus happens that all three may be seen in a single blood film. The nucleus is in all cases of much the same type. In dried films stained by Romanowsky stains it is a massive structure with a deep purple tint like that of the nuclei of leucocytes or nucleated red blood corpuscles and is quite unlike the nucleus of a malarial parasite or halteridium, which is smaller and more delicate and stains a bright red colour. The membrane enclosing the haemogregarines as they lie in the cytoplasm of the cell is elliptical or sausage-shaped, has rounded ends and is perfectly smooth and devoid of any knobs or protuberances. Furthermore, in blood films which have been made directly from the blood of a living animal all the haemogregarines are within the cells.

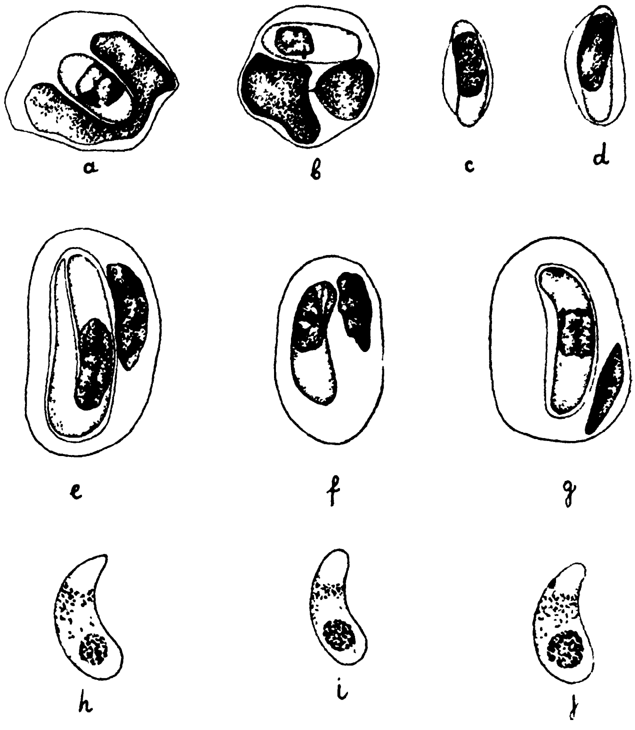


FIG. 1. Typical haemogregarines and spores of *Sarcocystis* as seen in dried films stained by Leishman stain. × 1000. *a* and *b*, haemogregarines in the leucocytes of the rat; *c* and *d*, haemogregarines in the red blood corpuscles of the jerboa; *e–g*, three types of haemogregarine in the red blood corpuscles of a cold-blooded animal; *h–j*, spores of *Sarcocystis*.

If, however, the animal has been dead some time, or if the blood is kept moist outside the body before the films are made, many of the haemogregarines will be found to have left the cells. This migration from the cell is undoubtedly the first stage in the further developmnet which occurs normally in the invertebrate host. Though the host cell may be enlarged and its nucleus displaced or otherwise altered in appearance the cell maintains its normal shape and regular contour. It has also to be remembered that haemogregarines do not come and go from the peripheral blood. Being forms which develop in an invertebrate they persist in the blood for long periods, like the crescents of *Plasmodium falciparum.*

It is important to bear all these points in mind when any structures which have a resemblance to haemogregarines are discovered in blood films or smears of organs. The uniform character of the enclosing membrane, the looping of certain forms within this membrane, the massive nature of the nucleus, and its colour reaction, and the intracellular situation in blood films made from living animals are the most important of these. With these facts before us, it will be possible to consider the various claims that have been made as to the occurrence of haemogregarines in man. These will now be examined chronologically.

Krempf's haemogregarine (Fig. 2). This organism, which was named *Haemogregarina hominis*, was seen by KREMPF (1917) in smears made from material which had been obtained by spleen puncture of a young Chinaman in Tien-Tsin suffering from splenomegaly. It was seen only in a few of the films made from this material, and even in these was present in very small numbers, for a lucky film was said to contain only one or two parasites. No further puncture of the spleen was made, but repeated examinations of the blood revealed nothing abnormal.

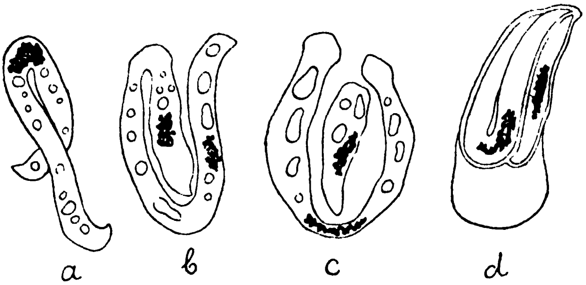


FIG. 2. *Haemogregarina hominis* Krempf, 1917. (Compare Fig. 9 F.2, I.3 and I.4.)

[Reproduced from the *Comptes Rendus de l'Academie des Sciences*, Paris.]

The organism is described as occurring in very much enlarged red blood corpuscles enclosed in a capsule or else free. The latter condition is attributed to rupture of the cell and liberation of the parasite as a result of smearing the material. The haemogregarine is said to be a long, narrow vermicule bent upon itself once or even twice. Those with three limbs divide transversely to form a large double-limbed form and a small form (Fig. 2 *c*). The long forms measure 20 by 1·5 μ. There is a single nucleus in the double forms and two nuclei in the triple forms. The nuclei stain a deep red colour while the blue-staining cytoplasm contains usually a number of round or oval bodies which have a bright red tint. Four diagrams are given, three of which depict free forms (Fig. 2 *a–c*) and one a form supposed to be in a red blood corpuscle (Fig. 2 *d*). No information is available as to the number of films made, but it seems evident that only a very small number of parasites was seen.

Whatever be the nature of the structures described they are certainly unlike any known haemogregarine. They are too long in proportion to their breadth and too irregular in outline. The fact that transverse binary division takes place suggests that they are not even Protozoa at all. The occurrence in the cytoplasm of the numerous homogeneous bright red bodies, together with the method of division, is strongly in favour of a vegetable organism. The looped form within what is supposed to be a red blood corpuscle may be a phagocyted individual in a large mononuclear cell, the cytoplasmic portion of which has broken off, a not infrequent occurrence in film making, or it may be superimposed upon a cell. Somewhat similar organisms (Fig. 9 I. 3, 4), which were seen in smears of the spleen of a case of kala azar in the Sudan, were figured by Bousfield (1911). These are undoubtedly vegetable cells. A similar structure (Fig. 9 F. 2) which occurred in what were undoubtedly contaminated blood films was depicted by Elders (1911). This also is probably a vegetable cell and it seems highly probable that Krempf's *Haemogregarina hominis* is also of this nature. If it were a haemogregarine it would have appeared in the peripheral blood, and there is no evidence that it is a Protozoon, much less a haemogregarine.

Dimond's haemogregarine (Fig. 9 D). This supposed haemogregarine was described by Dimond (1917) as the causative agent of trench fever. His findings and conclusions have already been questioned by Low (1917) and Dobell (1917). The films purporting to show this Protozoon were examined by competent observers, who found they were grossly contaminated with vegetable organisms of various kinds, so that there was not the least doubt that the cycle of development of Dimond's "haemogregarine" was deduced from a mixture of contaminating vegetable organisms and altered leucocytes. The figures he gives are, however, instructive in showing how such vegetable cells which contaminate films may bear a superficial resemblance to haemogregarines, not only in their shape but in the appearance that may be produced of an intracellular habitat (Fig. 9 D. 1).

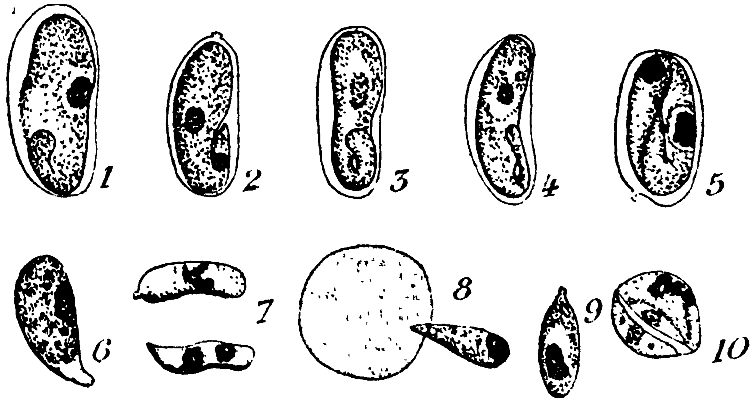


FIG. 3. *Haemogregarina inexpectata* Roubaud, 1919. × 2000 about. (Compare Fig. 4 *j–n* and Fig. 9 G.)
[Reproduced from the *Bulletin de la Société de Pathologie Exotique*.]

Roubaud's haemogregarine (Fig. 3). This organism was discovered by Roubaud (1919) in a single blood film made from a woman who had spent the period 1912 to 1914 in the Belgian Congo and had then lived in Europe. Seven days before the film was made in which the "haemogregarine" was discovered two other blood films had been examined without any detection of parasites. There was, however, a mononuclear increase which suggested a malarial infection. The day after the discovery of the organism four other films were made, but in none of these was any organism found. It thus appears that the "haemogregarine" was present in the blood on one day and had entirely disappeared by the next. This fact alone raises considerable doubt as to the correctness of ROUBAUD's interpretation of the organism.

As regards the structure of the "haemogregarine" several types are described.

1. Large forms, 9 to 11 μ in length by 2·8 to 3·5 μ in breadth (Fig. 3, 1–4). These measurements do not include the enclosing membranes, which are interpreted as remains of red blood corpuscles. The organism is looped and would thus correspond to the second or short-looped type of haemogregarine described above. The short limb is small and narrow and has a length of about 3 μ. It is swollen and bulbous towards its extremity. The cytoplasm stains a deep blue colour. The nucleus is small and about 1·5 μ in diameter. Occasionally there are two nuclei, and sometimes two organisms are present within one membrane. The enclosing membrane may show a kind of knob which takes the eosin of the stain (Fig. 3, 2 and 5).

2. Smaller young forms free in the plasma and regarded as metabolic owing to the variety of shapes they assume—oval, piriform, reniform (Fig. 3, 7–9). These are often binucleate. They are interpreted as merozoites and have a length of 5·2–5·8 μ and a breadth of 1·7–2·3 μ. These forms are said to be capable of invading the red cells, and one which is figured with its pointed extremity on the edge of a red cell is regarded as evidence of commencing penetration of the cell.

3. A schizont which might be expected to occur in the blood owing to the presence of the merozoites is depicted (Fig. 3, 10). It shows what is supposed to be a segmentation into merozoites.

Discussing the nature of these various bodies ROUBAUD remarks that the organism is undoubtedly a haemogregarine of special type and different from the well known haemogregarines of mammals. He regards it as distinct from the form described by KREMPF and gives it the name *Haemogregarina inexpectata*. LEBOEUF (1921), without giving any details, states that he found a single element in a spleen smear made from a case of splenomegaly in the Congo. He states that it appeared to resemble the structures described by ROUBAUD.

Quite apart from the fact that ROUBAUD's organism was absent from the blood on the day following that of its discovery, there are many points about it which give rise to grave doubts as to its haemogregarine nature. The presence of two nuclei is a very unusual feature in true haemogregarines, though it sometimes does occur, as in dividing forms of *Haemogregarina bigemina* of fish and occasionally in other forms. The characters of the nucleus, which is only 1·5 μ in diameter, are quite unlike those of any known haemogregarine. Furthermore, the presence of the knob on the enclosing membrane in some forms is strongly suggestive of something other than a red blood corpuscle, for red cells parasitized by haemogregarines have never before been described as developing this peculiarity. It is probable that the membrane actually belongs to the organism, for a similar knob is also figured on some of the forms called merozoites, which are not regarded as being intracorpuscular (Fig. 3, 7 and 9). The supposed penetration of the red cell at Fig. 3, 8, can equally well be interpreted as an accident in film making. As regards the schizont at Fig. 3, 10, this may be merely a modification of the form shown at Fig. 3, 5. It is not impossible that the contents divide into two and that a further division then occurs. The varying shape of the supposed merozoites resembles nothing which occurs amongst haemogregarines, the merozoites of which are not metabolic but uniformly gregariniform in character. Furthermore, the presence of a number of merozoites free in the plasma is not a feature of true haemogregarines. The bodies bear a resemblance to haemogregarines only in the presence of the loop, but this again differs from the turned-up limb of true haemogregarines in that its extremity is swollen and bulbous instead of being uniformly tapering. In view of the other discordant characters this loop alone is insufficient ground for characterizing the bodies as haemogregarines.

As in the case of KREMPF's organism, the writer is strongly of the opinion that ROUBAUD's is of vegetable nature. It is far from clear that it was actually in the blood, since in the most careful hands it happens from time to time that in some unexplained manner blood films become contaminated from without. There are many records of this in the literature, and some of these will be referred to below. Quite recently the writer had under observation certain ovoid bodies in faeces which were undoubtedly vegetable in nature (Fig. 4, *h* and *i*). When kept under observation for several days the contents were seen to divide into two elongate bodies. It is a well known fact that a division of the contents of certain vegetable cells into two, four or more daughter individuals occurs. *Chlamydomonas* (Fig. 4, *e–g*), for instance, is typically a biflagellated organism, but when division commences the flagella are lost; the cell wall or capsule is ovoid in shape, and has a small knob at one end; the contents divide into two elongate bodies, and each of these again to produce four; the daughter individuals are piriform in shape and in the possession of a knob at one end bear a striking resemblance to some of the forms depicted by ROUBAUD. Another form, *Polytoma uvella* (Fig. 4, *a–d*), which the writer has studied, divides in a similar manner. It is not impossible that such organisms might contaminate slides or even water which is employed for staining purposes. On several occasions the writer has been shown blood films containing problematic bodies which have been proved to have originated in the distilled water employed in the staining of the films. It seems not improbable that ROUBAUD's *Haemogregarina inexpectata* is a vegetable organism similar to those just referred to, that the turned-up limb may be the first stage in the process of division of the contents into two, and that the enclosing membrane is not the remains of a red blood corpuscle but the wall of the vegetable cell. If a dry film of *Polytoma uvella* is made and stained with Romanowsky stain, many of the organisms bear a striking resemblance to certain forms of ROUBAUD's "haemogregarine" (Fig. 4, *j–n*). Similarly, undoubted vegetable organisms which occur post-mortem in tissues appear in smears stained with Romanowsky stain with blue cytoplasm and red nuclei. The shrunken cytoplasm within the cell membrane may produce the impression of a parasite in the remains of a red blood corpuscle. A series of vegetable cells in a heavily contaminated spleen of a cat are shown at Fig. 4, *o–u*. In view of the points which have been raised, and the fact that the bodies were absent from the films made on the day following their discovery, it seems impossible, without more convincing evidence, to regard *Haemogregarina inexpectata* as a haemogregarine.

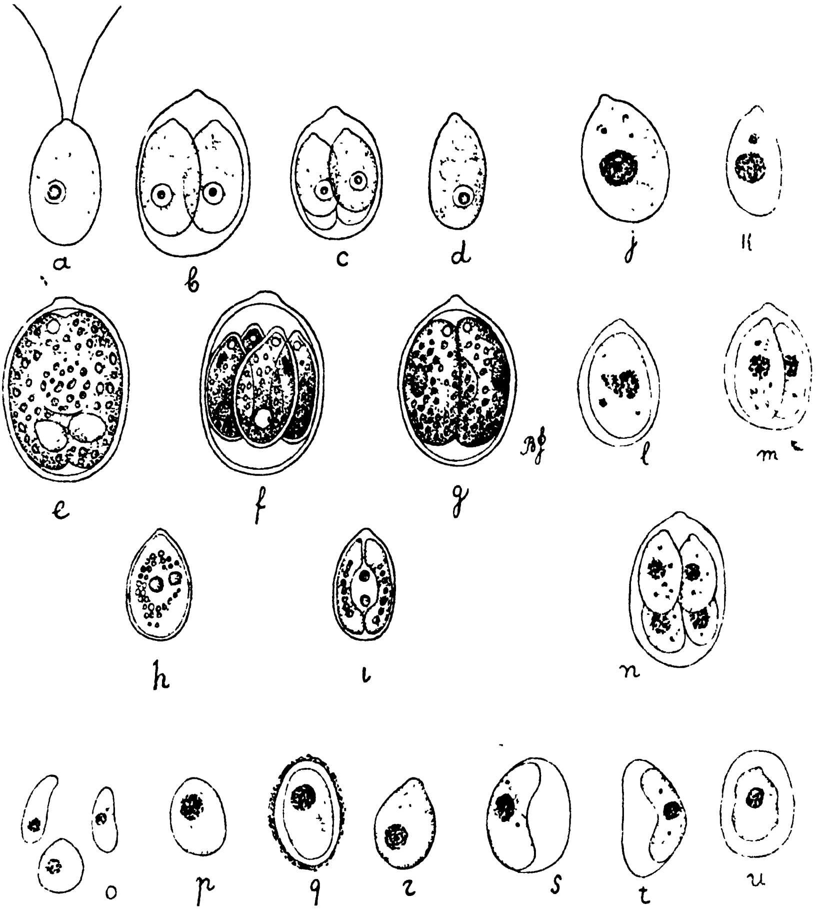


FIG. 4. Various vegetable cells which may contaminate films (× 1000) : *a–d, Polytoma uvella* fixed in Schaudinn's fluid and stained with iron haematoxylin ; *e–g, Chlamydomones angulosa* Dill, after Dill from Oetmann's treatise on the Algae ; *h–i*, vegetable cells from human faeces, two stages in the development of one organism as seen in the living condition ; *j–n, Polytoma uvella* in dried films stained by Leishman stain, the resemblances of these to some of Roubaud's "haemogregarines" is evident (compare Fig. 3) ; *o–u*, various vegetable organisms from heavily contaminated spleen of a dead cat ; dry film stained by Leishman stain ; the cytoplasm is blue and the nuclei red ; the retracted cytoplasm within the membrane may produce the impression of a sausage-shaped body in an altered red blood corpuscle.

Sergent (Ed. & Et.) and Parrot's haemogregarine (Fig. 5). These authors (1922) commence their description by stating that in Corsica they have found in a girl a blood parasite intra- and extra-globular which appears to be new. The child was three years of age and was apparently in good health, although living in a highly malarious district. The films, which were apparently made during the course of a malaria survey, consisted of two slides, one of which was spread as an ordinary thin film and the other as a thick film on which three drops were allowed to dry. No other examinations were made. In all, 128 forms of the parasite, which resembled a somewhat atypical haemogregarine, were found in these two slides. In the thin film sixteen parasites were seen, two of which are described as being intracellular. In the thick dehaemoglobinized film it was not possible, of course, to determine whether any were within the red cells. Nevertheless, in these thick films the parasites were still enclosed in a capsule, a fact which leads the authors to interpret the membrane as a capsule distinct from the red cell.

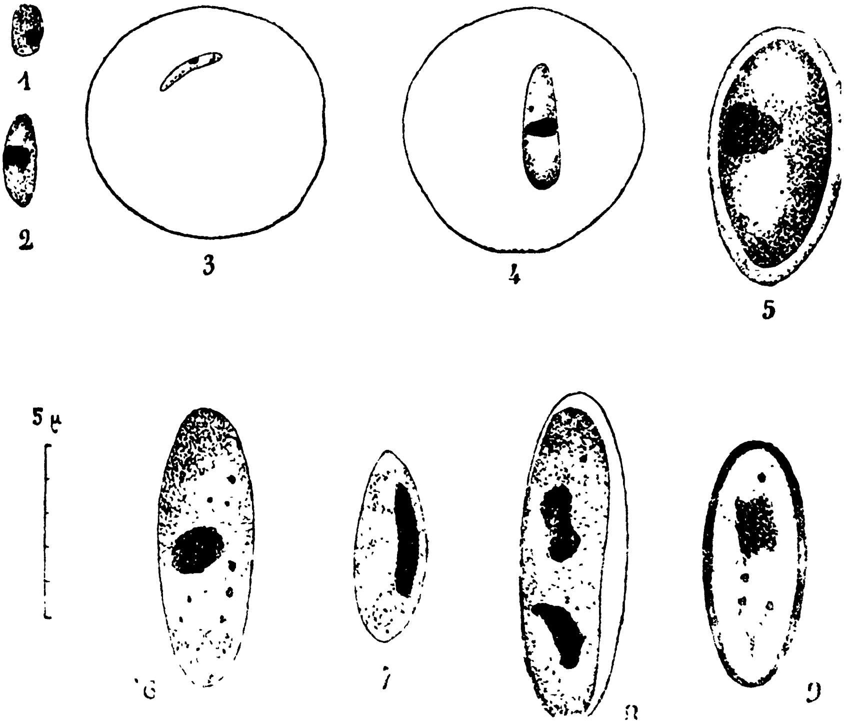


FIG. 5. *Haemogregarina elliptica* Sergent (Ed. & Et.) and Parrot, 1922. [Reproduced from the *Bulletin de la Société de Pathologie Exotique*.]

The description of the various forms seen is as follows :—

1. *Intracorpuscular forms.* These, of which only two were seen in the thin film, measured 2 by 0·4 and 3·5 by 1·0 μ (Fig. 5, 3, 4). They had the form of slightly curved rods with rounded ends, and consisted of homogeneous cytoplasm free from vacuoles but showing here and there somewhat clearer areas. The nucleus was central in position and slightly to one side. In each parasite besides the nucleus there occurred a large chromatic granule. The infected red cells were not altered in appearance in any way.

2. *Extracorpuscular forms.* These were very uniform in appearance and had the form of an ellipse with rounded ends. No vermicular stages were seen and no indication of a loop could be detected. The smallest form seen measured 1·4 by 1·0 μ (Fig. 5, 1), the largest 10·7 by 2·9 μ (Fig. 5, 8). The most frequent measurement obtained was 5–6 μ by 1·2–2·8 μ. In 49 forms, the length of which did not exceed 5 μ,

the cytoplasm was homogeneous and contained a compact nucleus and rarely a chromatic granule also (Fig. 5, 3 and 4). In the larger forms over 5 μ in length, of which 79 are mentioned, there were present capsule, cyst and nucleus which was drawn out or fragmented. Of these forms there were the following varieties :—

(*a*) In 8 individuals there was a capsule which was regularly elliptical in shape and which took a greyish-green colour with the Romanowsky stain. It appeared to be distinct from the remains of a red cell, for it was present in the well dehaemoglobinized films in which the red cells were destroyed (Fig. 5, 6 and 8).

(*b*) In 7 individuals the cyst was thick and stained a rose colour. The cytoplasm contained numerous chromatic granules and a granular nucleus (Fig. 5, 5 and 9).

(*c*) In 12 individuals which were over 5 μ in length there was a drawn-out nucleus, while in 7 others there were present two nuclei, an indication, according to the authors, of a process of transverse division (Fig. 5, 7 and 8). The nuclei of the large forms were often polygonal in shape ; at other times they were round or oval. They were usually central in position and somewhat marginal. In these large forms the cytoplasm often contained numerous chromatic granules and frequently a large vacuole at each extremity.

The authors regard the smallest forms as merozoites which become the intraglobular forms, two of which were seen in the thin film amongst the sixteen parasites which were present. The large ones are supposed to represent the first stages of encystment. The " haemogregarine " is named *Haemogregarina elliptica*.

If the statements regarding the bodies are critically examined it will be found that, as with the " haemogregarines " previously described, there is no reliable evidence that they were haemogregarines at all. The authors admit at any rate that they are atypical " haemogregarines." The first unusual feature is the large proportion of extracellular forms, 14 out of 16 in the thin film. In the case of true haemogregarines in films made directly from the animal practically all forms are intracellular. The fact that only two appeared to be intracellular can easily be explained on the supposition that the bodies lay over the red cells as the film dried, a common occurrence in the case of objects in the plasma. The general shape of the bodies would accord with the view that they were haemogregarines of Type 3, as no indication of a loop was seen, but many other objects have a similar shape and this alone cannot be regarded as evidence of their haemogregarine nature. The nuclei, which in many forms were marginal in position, are again unlike the nuclei of haemogregarines, and the presence of two such nuclei in an organism indicating, as the authors state, a process of transverse fission is a feature of exceedingly rare occurrence in these parasites. If the statement as to the occurrence of transverse division is intended to apply to the haemogregarine and not to the nucleus alone, this again is contrary to what occurs in these parasites. The thick red capsule which was sometimes seen, as also the occurrence in some of the forms of a fragmenting nucleus and numerous red-staining granules in the cytoplasm, are not features of true haemogregarines. The presence of the two terminal vacuoles, which is specially mentioned, is not a feature of these parasites. The writer cannot avoid the impression that the bodies correspond more closely with vegetable cells than with haemogregarines (see Fig. 10).

It is unfortunate that the blood of the child was examined on only one occasion, and from the description it seems probable that the two blood films were obtained from a single puncture of the skin, one thin film and one thick film being made. If the skin were contaminated with yeast-like organisms these would naturally appear in the films, and the occurrence of what are evidently extraneous bodies in films made during a malaria survey is familiar to the writer and must be also to others who have undertaken this kind of work. Such bodies again can find their way on to a film during the staining process if the water is in any way contaminated. In view of the fact that the authors were unable to make any further examination of the case it is impossible to exclude a skin contamination with absolute certainty. Even if it is admitted that the bodies were actually in the blood they are unlike haemogregarines in so many important respects that it is quite illogical to assume them to be of this nature. On the other hand their resemblance to vegetable organisms is so close that if any conclusion at all be legitimate it is that they are such, and probably of extraneous origin. The character of the capsule, the structure of the nuclei and the occasional presence of two in one organism, the numerous red granules in the cytoplasm and the terminal vacuoles are all in favour of this view. The writer is forced to the conclusion that *Haemogregarina elliptica* is not a haemogregarine but a vegetable cell.

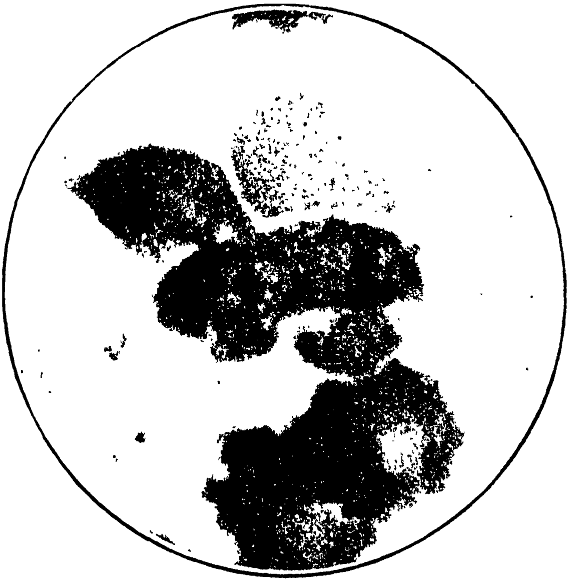


FIG. 6. *Haemogregarina gallica* Noc, 1922.
[Reproduced from the *Bulletin de la Société de Pathologie Exotique.*]

Noc's haemogregarine (Fig. 6). The parasite described was discovered by Noc (1922) in the blood of a patient 59 years of age who had always lived in the neighbourhood of Paris. He had suffered for several months from a continued fever of doubtful nature. In a film made from blood taken from the elbow vein was found a sausage-shaped body measuring 14 by 4·5 μ. One end was mucronate, while the other terminated in a turned-up tail 5·4 μ in length The tail, unfortunately, cannot be detected in the microphotograph illustrating the paper. The whole was enclosed by a simple membrane.

The organism lay, as the figure shows, against a broken red cell, but it was not possible to assert that it was actually within the cell. It possessed two vacuolated nuclei, one of which was near the centre, while the other was near one end. The median nucleus contained three chromatin granules of fairly large size, while the other was a red mass more ill defined. The body contained no pigment, but some dark granules were present in the membrane near the pointed end.

A second blood examination made on the following day showed in one film a vermicular form of the parasite measuring 15 by 4 μ, with an oval chromatic granule. There was a small " gregariniform " prolongation anteriorly, while the posterior end was narrow but not looped. The patient was in such a grave condition that it was not possible to undertake a systematic examination of the blood. However, a few drops of blood were obtained with difficulty, so that in all six thin films and four thick ones were secured. In addition to the forms described above, a group consisting of two merozoites, 5–6 μ in length by 1·5 μ in breadth, accompanied by a small spherical mass, 1·5 μ in diameter, was seen. The small spherical body was regarded as being possibly a third merozoite. No other organisms were seen in the films. The patient died shortly after, but it was not possible to perform an autopsy. The author discusses the relation of his organism, which he assumes to be a haemogregarine, to those previously described, and considers that it resembles ROUBAUD's *Haemogregarina inexpectata* in some respects, but differs in its larger size, the greater thickness of the enclosing membrane, the presence of the three bright red ovoid chromatin masses in one of the nuclei, the larger size of the merozoites, and the presence of external pigment round the end of the capsule. On this account the author proposes to call his parasite *Haemogregarina gallica*. In a discussion following the presentation of the paper, ROUBAUD remarks that in his opinion there is insufficient evidence to justify the creation of a new species. He thinks that NOC's parasite is probably identical with the one he called *Haemogregarina inexpectata*.

NOC's description is accompanied only by a microphotograph of the large sausage-shaped body (Fig. 6). This shows very little detail, but it depicts a body bearing some resemblance to the large forms of ROUBAUD's organism. The mucronate extremity is suggestive of a vegetable cell like *Polytoma*. All that is mentioned about the merozoites is that they were slightly curved. It seems impossible to speculate as to the nature of these bodies. If they were actually haemogregarines it is curious that the only forms seen should have been so atypical. The presence of two nuclei and the structure of these would suggest that the organism is not a haemogregarine. Here again it is not impossible that the bodies were of extraneous origin. If the supposed parasite had been a haemogregarine surely the examination of the films would have revealed something more characteristic, and if, as the author seems to assume, the grave condition of the patient was due to this infection the blood should have contained a larger number of organisms. The discovery in blood films of a few problematic structures like those described is quite insufficient to justify the assertion that they were actually haemogregarines.

Nattan-Larrier's haemogregarine. The publication of the above-recorded observations on human " haemogregarines " led the author (1922) to give an account of certain bodies he had found in the blood of a patient, in 1906, who had been in the Belgian Congo. Only one film was examined, and in this two trypanosomes (*T. gambiense*) were found in addition to the bodies described as haemogregarines. The latter were fairly numerous, the preparation showing four to every hundred leucocytes. In the present paper, which the author says is a preliminary note, he describes what he regards as the more typical forms. They had the form of a lentil, with sharp and regular contours. The two poles were alike and were generally obtuse. The length varied from 6 to 7·5 μ and the breadth from 1·6 to 2·4 μ. In films stained with Leishman or Giemsa stain the cytoplasm was blue and contained a number of chromatin granules and possibly fine granules of a blackish pigment. The centrally placed nucleus usually lay against the convex border of the parasite. It was small and had a diameter which reached a third, or at most a half, of that of the organism itself. It was often surrounded by a clear area of cytoplasm. Some of the "haemogregarines" were surrounded by a fine refringent membrane. The author concludes that this "haemogregarine" approaches *Haemogregarina elliptica* of the SERGENTS and PARROT, but that it differs in certain details which will be communicated in a paper to be published later. It cannot be mistaken for *Haemogregarina hominis* of KREMPF, nor for *Haemogregarina inexpectata* of ROUBAUD. On this account a new species, *Haemogregarina equatoralis*, is created.

No figures accompany this description, but as none of the organisms is described as being intracellular it may safely be assumed that they were free in the plasma, in which case they would be quite unlike haemogregarines. Apart from this, however, there is no evidence whatever that they are of this nature. The small size of the laterally-placed nuclei, the lentil shape of the parasites, and their small size and the presence of the refringent capsule leave no doubt that the bodies described bear very little resemblance to any known haemogregarine. In this case, again, they were found in a single film, and it is impossible to assert that they were not of extraneous origin. Like the other "haemogregarines" described, they are most probably vegetable cells of yeast-like nature.

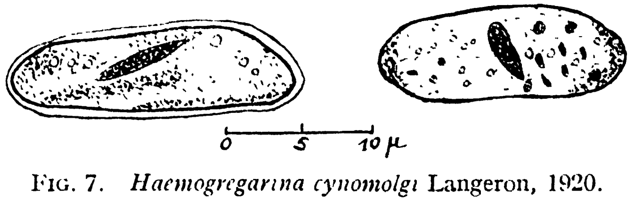


FIG. 7. *Haemogregarina cynomolgi* Langeron, 1920.
[Reproduced from the *Bulletin de la Société de Pathologie Exotique*.]

Langeron's haemogregarine (Fig. 7). LANGERON (1920), influenced by the descriptions which had appeared of the human "haemogregarines," was led to call attention to certain bodies which BLANCHARD and LANGERON (1912) had recorded from the blood of a monkey (*Macacus cynomolgus*) infected with the malarial parasite *Plasmodium kochi*. The bodies in question, only three of which were seen on a single occasion, were ovoid and measured 17–19 μ by 5·6 μ. The cytoplasm stained intensely blue, and contained numerous red-staining granules. Near the centre was a somewhat elongated area of red-staining material, the nucleus. Of the three bodies, one was surrounded by a pink-staining membrane, which is interpreted as the membrane of a red blood corpuscle, while the others appeared to be devoid of membrane and are described as being free in the plasma. Subsequent examinations of the blood and organs of the monkey did not throw any light on the supposed parasite, which is said to have affinities as obscure as those of the human haemogregarines. Nevertheless the conclusion is reached that it is actually a haemogregarine and the name *Haemogregarina blanchardi* was given it. It appeared, however, that this name had previously been used for a haemogregarine of a fish, so LANGERON (1920 *a*) proposed to substitute the name *Haemogregarina cynomolgi.*

As with the other records, the presence of the supposed parasite in the blood on only one occasion is a very strong argument against its haemogregarine nature. The large size of the bodies and the character of the nuclei are not those of parasites of this kind, while the occurrence of vacuoles and other granules in the cytoplasm, together with the shape, is strongly suggestive of some vegetable cell. The supposed membrane of one of the bodies, which is thought to be that of a red blood corpuscle, can equally well be interpreted as the membrane of a vegetable cell. The writer has recently had an opportunity of discussing these bodies with M. LANGERON, who has very kindly permitted him to examine the slide. The film was made from the monkey's ear, which was in bad condition owing to repeated incisions for abstraction of blood. There are present in addition to the three bodies a number of yeasts and bacteria. M. LANGERON himself is far from being convinced that the structures he described as haemogregarines are actually of this nature. It seems to the writer that they are most probably large vegetable cells. The large " bacilli " which commonly occur in the intestine of rabbits, when dried and stained by Leishman stain, appear as large sausage-shaped bodies with red nuclei and show just as much resemblance to haemogregarines as do LANGERON's and NOC's organisms (Fig. 10). They frequently possess two terminal vacuoles and red-staining granules.

Leger and Bédier's haemogregarine. This organism was discovered post-mortem by LEGER and BÉDIER (1922) in films of the heart blood of a baboon (*Papio sphinx*) which had died in the Biological Institute in Senegal. The animal had an infection of *Plasmodium kochi.* The " haemogregarine " appeared to be free in the plasma and occurred in the form of elongate bodies with rounded ends measuring 16 by 5·5 μ. The blue vacuolated cytoplasm contained, in addition to the nucleus, a number of chromatoid granules. The nucleus is described as a caryosome which lay obliquely near the thicker end of the organism. In addition to these large bodies other smaller forms were seen, measuring 2·5 to 4 μ in length. The authors are doubtful if these are actually stages of development of the " haemogregarine." They point out that the absence of pigment excludes them from the cycle of the malarial parasite, but they do not consider the possibility of their being vegetable cells, a view which appears to the writer to be the most reasonable. LEGER and BÉDIER believe the " haemogregarine " to be allied to *Haemogregarina cynomolgi* of LANGERON, and they propose to name it *Haemogregarina cynomolgi* var. *papio.* There are no figures accompanying the description of the organism. In this case, as in so many of the preceding ones, the organism was only found on one occasion post-mortem, and the fact that the small bodies also occurred is strongly suggestive of the tissues of the baboon having become contaminated after death.

Mention may be made here of two other supposed haemogregarines which have been recorded from cattle. MARTOGLIO and CARPANO (1906) described as *Haemogregarina bovis* certain elongate, slightly curved bodies measuring 7–10 by 1·6–2 μ which they found free in the plasma in a wet blood film made from an ox and which had been kept moist overnight (Fig. 8, *a–c*). When the film was smeared and stained with Romanowsky stain the bodies were blue and showed a central elongate nucleus. One appeared to have a dividing nucleus and was bifurcated (Fig. 8, *b*). Further films made from the blood of the animal failed to reveal any of the supposed parasites, while an exhaustive examination of the blood and organs when the animal died some time later was likewise negative. There can be no doubt that the "haemogregarine" was a contaminating vegetable organism.

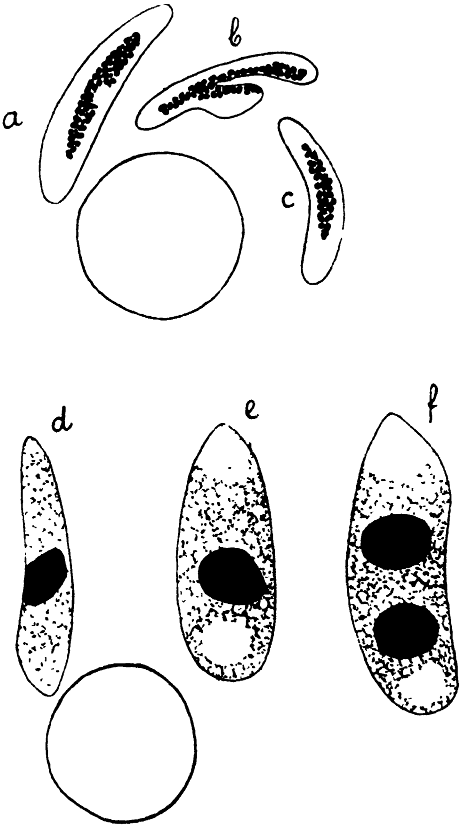


FIG. 8. *Haemogregarina bovis* Martoglio and Carpano, 1906 (*a–c*), and *Haemogregarina boum* Legras, 1918 (*d–f*).

The second "haemogregarine" of cattle is one which was discovered by LEGRAS (1918) in the blood and lymphatic glands of a heifer which had been inoculated nine days before with an emulsion obtained from the lungs of a cow affected with jaundice (Fig. 8, *d–f*). The bodies, which are called *Haemogregarina boum*, varied in length from 6·7 to 8·6 μ and in breadth from 1·5 to 2·5 μ. In all, ten of the bodies were found, one only of which occurred in 31 blood films. The remaining nine were in smears of the lymphatic glands. Seven of the bodies had a single nucleus at the centre, while three had two nuclei. Most of them possessed one or two terminal vacuoles. It is pointed out that the latter condition is remarkable, since multiplication by transverse fission, which these forms appear to indicate, is unknown amongst true haemogregarines. Nevertheless, the conclusion is reached that one of these parasites is represented. The fact that only one form was seen in 31 blood films shows that the organism did not behave like a haemogregarine, and in view of their extracellular position, two nuclei and terminal vacuoles, there is little doubt that *Haemogregarina boum* is a vegetable organism.

In addition to the structures which have been described above and have been definitely claimed to be haemogregarines several observers have recorded similar bodies from man. Thus MANSON (1905) described certain structures which were found in smears of the spleen and liver made from a fatal case of kala azar (Fig. 9, G). It was thought that they possibly represented some hitherto unrecognized stage of the Leishman-Donovan body, but, on the other hand, it was realized that they might have resulted from accidental contamination of the slides. The writer saw these films and has no hesitation in stating that the structures were yeast-like organisms. The resemblance they bear to the supposed haemogregarines of man will be evident from the figure which is reproduced here.

Similarly, ELDERS (1911) described a very varied assemblage of organisms as occurring in the blood of obscure cases of fever in Sumatra (Fig. 9, F). It is quite evident that all of these result from contamination of the blood films, as, indeed, SCHÜFFNER (1911) pointed out. SCHÜFFNER remarked that some of the supposed organisms represent fungi or algae which are frequently found in preparations in Sumatra and come either from the air or water. An inspection of the coloured plate accompanying ELDERS' paper will convince any critical observer that SCHÜFFNER's view is correct, yet it will also be evident that some of the bodies figured by ELDERS bear a superficial resemblance to haemogregarines.

BOUSFIELD (1911), working in the Sudan, discovered and figured certain " unrecognized bodies in kala azar spleen films " (Fig. 9, I). It is supposed that these may be altered Leishman-Donovan bodies as a result of an injection of orsudan. They are undoubtedly vegetable organisms and some of them in the possession of a single large central mass and in their sausage-shape resemble haemogregarines. The larger forms, though not looped, appear to be similar to KREMPF's " haemogregarine."

BALFOUR (1911), in a paper on " Fallacies and Puzzles in Blood Examination," gives a coloured plate of a blood film made from a Uganda cob which had been shot (Fig. 9, E). This film contained numerous structures which were undoubtedly contaminations, probably as a result of wounding of the intestine and mixture of the escaping contents with the blood. Some of the bodies bear a striking resemblance to haemogregarines.

CASTELLANI and CHALMERS (1919, p. 538) record the discovery by SAMBON in a lemur of certain structures which they say may have some relation to the spores of *Sarcocystis*. The writer saw these films, which were made from the lemur post-mortem. He has no hesitation in stating that they were sausage-shaped vegetable organisms, which nevertheless had some superficial resemblance to haemogregarines. They had probably invaded the tissues from the intestine after the death of the animal.

CASTELLANI and WILLEY (1905) describe and figure certain elongate sausage-shaped structures, which they observed " in the finger-blood of a native fever patient " (Fig. 9, H). There is little doubt that these are vegetable cells which have contaminated the blood films. Similar organisms, evidently contaminations, are figured as occurring in the blood of birds. As regards those in the human blood, CASTELLANI and CHALMERS (1919, pp. 537–538) say that they may be the spores of *Sarcocystis*, but they are again quite unlike these bodies (Fig. 1, *h–j*).

It may be mentioned here that SERGENT (1921) discovered numbers of undoubted spores of *Sarcocystis* in a blood film made from blood obtained from a puncture of the skin of an ox. These spores, as they appear in dried films stained with Romanowsky stain, are slightly curved sausage-shaped blue structures with a large central nucleus (Fig. 1, *h–j*). Both ends are rounded, but one is narrower than the other and the narrow end consists of clear homogeneous cytoplasm (the capsule), which contrasts with the more deeply staining granular cytoplasm of which the remainder of the spore is composed. None of the " haemogregarines " described from man or monkeys resembles the spores of *Sarcocystis*.

Another organism which can probably be explained on the assumption that it is a vegetable cell is *Toxoplasma pyrogenes* Castellani, 1914, which was discovered in smears of the spleen and blood of a case of splenomegaly in Ceylon. The description given in the original paper (1914) and that in CASTELLANI and CHALMERS, *Manual of Tropical Medicine* (Third Edition, 1919, pp. 489–490) are somewhat discordant. Two types of parasite are described. The commonest form has a roundish, oval or crescentic form with pale blue-staining cytoplasm and a large chromatin mass at one pole or at the centre (Fig. 9, B. 1–4). The second type is a larger spherical body 8–12 μ in diameter and containing several masses of chromatin (Fig. 9, B. 5). It is supposed that this is a schizont. In the original paper the small forms are said to be confined to the spleen, while the larger bodies, which are exceedingly rare, are said to occur in the blood as well as in the spleen. Examination of the coloured plate accompanying the original paper shows that the large form depicted from the blood is identical with the large form depicted from the spleen. And this identity is so close as regards the number, shape, size and arrangement of the chromatin granules that one is tempted to assume that both the drawings were made from the same object. This temptation becomes greater when it is found that in the description of the parasite in the *Manual of Tropical Medicine* it is stated that this type occurs only in the blood. Quite apart, however, from this discrepancy, there appears to be no evidence that the bodies are Protozoa at all. The large ones are undoubtedly degenerate leucocytes or fragments of a broken-down mononuclear cell with ruptured nucleus. The small ones are probably vegetable organisms like yeasts, which in smears frequently appear like the bodies drawn in the plate. Reporting on CASTELLANI's preparations, PLATE (1914) says that he is " absolutely convinced that the bodies are not degenerated red cells nor degenerated blood platelets nor degenerated tissues of any kind. The free bodies are especially characteristic, most of them being

FIG. 9. Various bodies, probably of vegetable nature, which have been described as parasitic protozoa. The magnification is indicated by the red blood corpuscles.

A. *Toxoplasma pyrogenes* reproduced from Plate (1914) from films made by Castellani.

B. *Toxoplasma pyrogenes* reproduced from Castellani (1914). 1–4, small forms ; 5, large form described as schizont (compare Fig. 4, *o*, *p*, *r*).

C. *Toxoplasma pyrogenes* reproduced from Fedorovitch (1916). (Compare Fig. 4, *o*.)

D. Dimond's haemogregarine of trench fever.

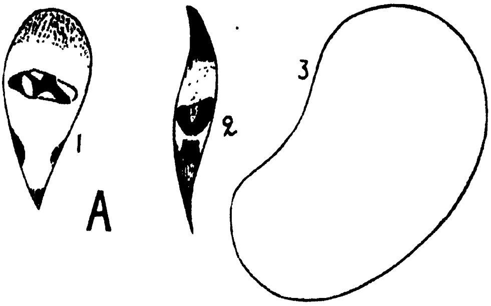
E. Vegetable cells depicted by Balfour (1914) from a contaminated blood film of a Sudan cob. The form E 3 bears a striking resemblance to a haemcgregarine (compare Fig. 1, *c*, *d*).

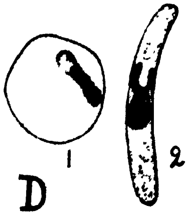
F. Vegetable cells and other organisms described by Elders (1911) as parasites in human blood. The form at F 3 may be a *Euglena* or *Astasia* (compare Fig. 3, 8, Fig. 5, 4, Fig. 8, *d*).

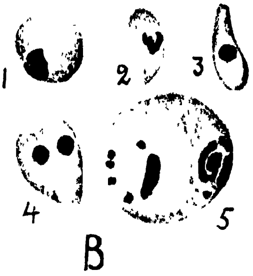
G. Vegetable cells described by Manson (1905) from a spleen smear made post mortem from a case of kala azar.

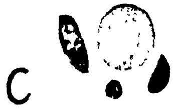
H. Vegetable cells described by Castellani and Willey (1905) from human blood. Castellani and Chalmers (1919) make the suggestion that they may be spores of *Sarcocystis* (compare Fig. 1, *h*–*j*).

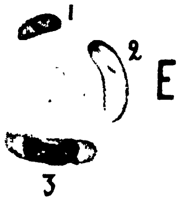
I, Vegetable cells seen in spleen smear of a case of kala azar by Bousfield (1911).

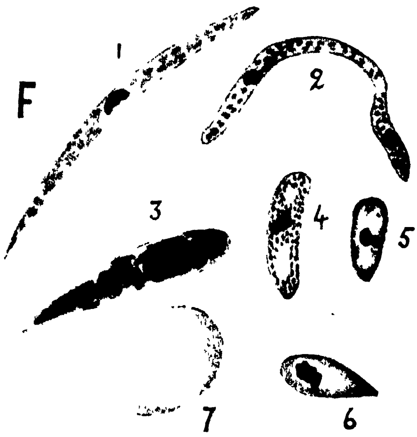

1
2
3
A

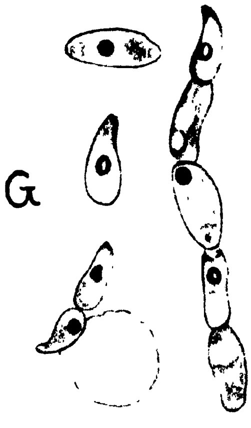

1
2
D

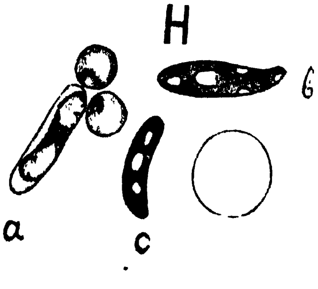

1
2
3
4
5
B

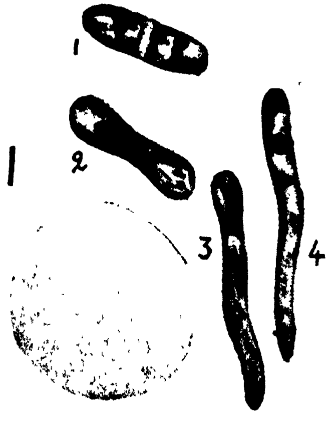

C


1
2
E
3


F
1
2
3
4
5
7
6


G


H
6
a
c


1
I
2
3
4

pear-shaped, crescentic or lanceolated; 2½ to 6 μ in maximum diameter and possessing a well developed nucleus, either in the middle or at one pole, which may at times be vacuolated ; none of the bodies contained any pigment. Occasionally these bodies are agglomerated together in large groups." He continues that in his opinion " the bodies described by CASTELLANI with the name *Toxoplasma pyrogenes* are, without doubt, of protozoal origin and differ from any other protozoal organism so far described in man ; but no conclusion can as yet be come to as regards their being toxoplasmata or not ; in fact no conclusion can be arrived at as regards their exact zoological classification." PLATE's account is accompanied by a drawing (Fig. 9, A) of two of these bodies which show far more details than the obviously schematic figures given by CASTELLANI. It does not appear to have occurred to PLATE that there was a possibility of such structures in spleen smears being vegetable cells, for having decided that it was impossible to determine their exact zoological classification he would, if he had been familiar with such sources of error, have considered this possibility before concluding that they were without doubt of protozoal origin. The figures he gives undoubtedly represent vegetable organisms.

It is stated by CASTELLANI and CHALMERS (1919) in a support of CASTELLANI's claim that FEDOROVITCH discovered similar bodies in the peripheral blood of a case of splenomegaly in a child and a dog on the Black Sea Coast. FEDOROVITCH (1916) states that he discovered these bodies, which were not intracorpuscular, in the peripheral blood taken from the ear of the child (Fig. 9, C). They measured 2–3 to 7 μ in length. Most of them were oval and elongated, and with one extremity pointed. Other forms were smaller and round. With Giemsa stain they appeared with blue cytoplasm and red nucleus. Some of the parasites took a lilac colour. The nucleus was either central or terminal in position. He says the parasite is closely related to that described by CASTELLANI. He hesitates to classify the organism, but states that in 1905 he found a similar parasite in the blood of a dog. The coloured figures given by FEDEROVITCH leave no doubt that the bodies were vegetable organisms like large cocci and yeasts. The elongate forms correspond exactly with those depicted at (Fig. 4, O). which were present in a heavily contaminated spleen of a cat. CHALMERS and KAMAR (1920) claimed to have found this parasite in the Sudan but, as pointed out by the writer (1922), the structures seen in this case were altered *Leishmania*. It is the writer's opinion that the organism called *Toxoplasma pyrogenes* is neither a Toxoplasma nor a protozoon, and that the name is a *nomen nudum*, as it is given to certain unidentifiable vegetable cells.

The spindle-shaped structures, 40 microns in length, recorded from human blood as Protozoa by Ed. & Et. SERGENT (1903) and named *Sergentella hominis* by BRUMPT (1910), are almost certainly of vegetable nature. They resemble the form at Fig. 9, F. 1 with which they may be identical.

In this connexion a paper published by ROCHA-LIMA (1912) is most instructive. In a clear description, which is accompanied by an excellent coloured plate, this author showed how *Cryptococcus farciminosus* and *Histoplasma capsulatum*, both of which are unquestionably vegetable organisms, were mistaken by numerous observers for Protozoa related to *Leishmania*. He pointed out that yeast-like bodies of this description, when stained with Romanowsky stains after drying, often showed a blue cytoplasm containing a large red mass as well as a separate and distinct red granule. The presence of similar structures in some of the human "haemogregarines" has been noted above.

ALEXEIEFF (1912) was so impressed by the resemblance of haemogregarines to certain stages of *Euglena* and *Astasia* which he found in the intestine of tadpoles and cyclops, that he considered it possible that haemogregarines had been evolved from these vegetable-like flagellates which had acquired parasitic properties.

To illustrate how "haemogregarines" may be produced, Fig. 10 has been made. The organisms depicted have blue cytoplasm and red nuclei. They actually represent the large "bacilli" which commonly occur in the faeces of rabbits. The films are prepared as follows. Some of the faeces is mixed with water and, when the sediment has formed, a drop of the water is spread as a thin film on a slide and allowed to dry. A blood film is then spread and the film is stained with Leishman stain. This simple experiment will convince anyone of the difficulty there would be of distinguishing such organisms from Protozoa if they occurred unexpectedly in blood films. It is hardly necessary to emphasize the resemblance they have to some of the "haemogregarines" described.

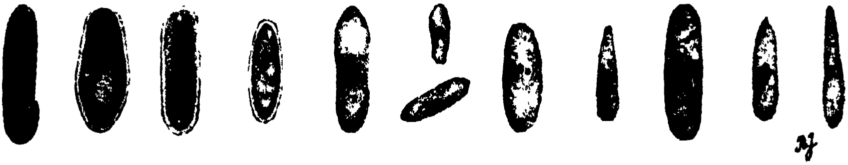


FIG. 10. Vegetable cells in blood film intentionally contaminated with organisms from the intestine of a rabbit. Note the appearance of a loop and the mucronate extremity.

From what has been said above it is clear that in the course of investigations observers have on many occasions been misled into describing as Protozoa structures which are undoubtedly vegetable organisms. It is the writer's opinion that the so-called haemogregarines of man are of this nature. In some cases the vegetable cells, as with *Cryptococcus farciminosus* and *Histoplasma capsulatum*, were actually parasitic in the tissues examined. In other cases they have been the result of invasion of the tissues, probably from the intestine after death, while in others they have resulted from outside contamination of the films. Such vegetable cells and yeasts when present in smears stained by the usual Romanowsky stains often appear remarkably like Protozoa (Fig. 4, *o–u*). The cytoplasm stains a varying depth of blue, while the nucleus appears as a mass of bright red granules. In some cases the wall of the vegetable cell is not apparent, while in others it is clearly visible. The cytoplasm within it may shrink in various ways. Sometimes it does so in such a manner as to leave a space between it and the cyst wall, while in others it becomes a sausage-shaped body lying against the side of the cyst. The resemblance of such forms to parasites within altered red blood corpuscles is evident. From the fact that in practically all instances the "haemogregarines" of man were found in only a single blood film or in a series of films made at one time, and that in several cases subsequent examinations of the blood revealed no organisms, the writer feels that it is impossible to exclude the entry into the films of extraneous organisms. He is convinced that all the forms described are better explained on the assumption that they are vegetable cells of such an origin than that they are Protozoa. The most careful observers are bound to find vegetable organisms in blood films from time to time. This is easily explained in the case of blood films made, for instance, from a rat's tail, in which an extraordinary assemblage of yeasts and bacteria often occur.

In the case of human beings, such gross contamination of the skin is of rarer occurrence. Quite recently, however, the writer was asked to examine a blood film which had been made from the finger of a well-known man. There occurred groups of bodies which were thought to be possibly leishmania. It was apparent, however, that they were yeasts, and the presence in the films of various types of bacteria showed that there had been contamination from a dirty finger or slide. It is unfortunate that the various authors who have described the " haemogregarines " of man have made no statement as to the presence or absence in their films of contaminating organisms.

It is a fact which is well known to haematologists of any experience that extraneous organisms may be found in films as a result of contamination of the slide or of the skin, or deposits from the air. But it is not always realized that they may be present in the distilled water used in the staining process, which may quickly develop flagellates and other organisms, especially in the tropics, as noted by MARSHALL (1911) in the Sudan. When such a fluid is used to dilute the alcoholic stain, the organisms are fixed by the alcohol. They then sink and adhere to the film and become stained. The writer has seen this occur on several occasions and has been able to demonstrate the presence of flagellates in the water. It seems to him that the organism described by LEGER, M. (1919, 1920) as *Trypanophis malignus* from the blood and organs of cases of fever in French Guiana can probably be accounted for in this manner. The figure given by LEGER (1920) shows flagellate organisms which bear more than a striking resemblance to flagellates which the writer has seen in blood films and which he has been able to prove have originated from the distilled water employed for diluting Leishman stain. It is significant that. LEGER (1919) compares his flagellate with *Haemocystozoon braziliense* described by FRANCHINI (1913) from the blood of a man who had resided in Brazil. There can be no doubt that in this case again the organism is the result of contamination, as pointed out by BRUMPT (1913), and it is not improbable that it found its way into the films from the water used in the staining process.

It is the opinion of the writer that haemogregarines of man have still to be discovered, and that the various organisms noted above, which have been interpreted as parasites by different observers, are not of this nature. If ever a haemogregarine of man be discovered it can safely be assumed that it will reveal more definite evidence of its real nature than that furnished by the forms described. It will be present in the blood more or less continuously and will not disappear rapidly from the circulation. The discovery of any problematic body in a blood film, especially when this occurs on only one occasion, must always be regarded with suspicion unless all other sources of its origin have been excluded.

REFERENCES.

Alexeieff, A. (1912). Le parasitisme des Eugléniens et la phylogénie des Sporozoaires sensu stricto.—*Arch. Zool. Exp. Gen.* [5], x, N. et R. p. lxxiii.

Balfour, A. (1905). A Haemogregarine of Mammals, *H jaculi.—H. balfouri* (Laveran).—*Jl. Trop. Med. & Hyg.* viii. 241.

—— (1911). Fallacies and Puzzles in Blood Examination.—*Fourth Report, Wellcome Tropical Research Laboratories, Khartoum.* Vol. A. 109.

Bentley, C. A. (1905). Preliminary Note upon a Leucocytozoon of the Dog.—*Brit. Med. Jl.* May 6. 988.

Blanchard, R., & Langeron, M. (1912). Le Paludisme des Macaques.—*Arch. de Parasitologie.* (*Plasmodium cynomolgi* Mayer, 1907). xv. 534 & 542.

Bousfield, L. (1911). Remarks on Kala-azar in the Kassala and Blue Nile Districts of the Sudan.—*Fourth Report, Wellcome Tropical Research Laboratories, Khartoum.* Vol. A. 138

Brumpt, E. (1910). Précis de Parasitologie. Paris. 158.

—— (1913). A propos de l'*Haemocystozoön brasiliense* de Franchini.—*Bull. Soc. Path. Exot.* vi 377.

Castellani, A. (1914). Note on Certain Protozoa-like Bodies in a Case of Protracted Fever with Splenomegaly.—*Jl. Trop. Med. & Hyg.* xvii. 113.

—— & Chalmers, A. J. (1919). *Manual of Tropical Medicine.* 3rd Edition. pp. 489–490 & 537–538.

—— & Willey, A (1905). Observations on Haematozoa in Ceylon.—*Quart. Jl. Mic. Sci.* xlix. 383.

Chalmers, A. J., & Kamar, A. (1920). *Toxoplasma pyrogenes* Castellani 1913. —*Jl. Trop. Med. & Hyg* xxiii. 45.

Christophers, S. R. (1905). *Haemogregarina gerbilli.*—*Sci Mem. Off. Med. San. Dep. Gov. India.* No. 18

Dimond, L. (1917) Trench Fever or P U.O., Associated with the Presence of a Haemogregarine.—*Lancet.* Sept. 8. 382

Dobell, C. (1917). The " Haemogregarine " of Trench Fever. [Correspondence.]—*Lancet.* Sept. 22. 473.

Elders, C (1911). Ueber eine klinisch und atiologisch der Trypanosomiasis und Schlafkrankheit verwandte Krankheit bei Javanen auf Sumatra.—*Arch. f. Schiffs- und Tropen-Hygiene.* xv. 1

Fedorovitch, A. I. (1916). Hémoparasites trouvés dans un cas de fièvre chronique.—*Ann. Inst. Past* xxx 249

Franchini, G. (1913) Un nouveau protozoaire parasite de l'homme provenant du Brazil.—*Bull. Soc Path Exot* vi 156.

—— (1913) Nouvelle contribution à l'etude de *Haemocystozoon brasiliense.*—*Ibid* 333.

James, S. P. (1905). On a Parasite found in the White Corpuscles of the Blood of Dogs.—*Sci Mem. Off Med. San. Dep. Gov. India* No. 14.

Krempf, A (1917). Sur un Hématozoaire endoglobulaire nouveau de l'Homme (*Haemogregarina hominis*).—*C. R. Acad. Sci.* clxiv. 965

Langeron, M. (1920). Sur une Hémogrégarine d'un Macaque.—*Bull. Soc. Path. Exot.* xiii. 165.

—— (1920). Note additionnelle sur une Hémogrégarine d'un Macaque.—*Ibid.* 394.

Laveran, A. (1905) Sur une Hémogrégarine des gerboises.—*C.R. Acad. Sci.* cxli 295.

Leboeuf. (1921). Megalosplenie et Hémogrégarine en Afrique équatoriale.—*Ann. Méd. et Pharm. Coloniales.* xix. 116.

Leger, M. (1919). Hématozoaire flagellé nouveau dans une pyrexie cliniquement non classée.—*Bull. Soc. Path. Exot.* xii. 80.

—— (1920). Pyrexie mortelle à Allure spéciale, causée par un Flagellé à la Guyane française.—*Ann. Inst. Past.* xxxiv 481.

—— & Bedier, E. (1922). Hémogrégarine du Cynocéphale, *Papio sphinx* E. Geoffroy.—*C. R. Soc. Biol.* lxxxvii. 933.

Legras, S. (1918). Sur des formes hémogrégariniennes vues dans le sang et dans le tissu ganglionnaire des bovidés d'Algérie.—*Bull. Soc. Path. Exot.* xi. 274.

Low, G. (1917). The " Haemogregarine " of Trench Fever. [Correspondence.] —*Lancet.* Sept. 22. 473.

Manson, P. (1905). Notes on Two Cases of Febrile Tropical Splenomegaly (Kala-azar) and a Suggestion.—*Brit. Med. Jl.* Nov. 11. 1261.

Marshall, W. E. (1911). Kala-azar Commission to Investigate the Prevalence and Cause of the Disease in the Sudan.—*Fourth Report, Wellcome Tropical Research Laboratories, Khartoum.* Vol. A. p. 169 & Plate X.

Martoglio, F., & Carpano, M. (1906). Sopra un Caso di " *Haemogregarina bovis.*"—*Ann. d'Ig. Sperim.* xvi. 251.

Nattan-Larrier, L. (1922). Sur une hémogrégarine de l'homme. (Note préliminaire.)—*Bull. Soc. Path. Exot.* xv. 943.

Noc, F. (1922). Formes hémogrégariennes observées dans un cas d'anémie pernicieuse autochtone.—*Bull. Soc. Path. Exot.* xv. 936.

Nöller, W. (1913). Die Blutprotisten des Wasserfroches und ihre Übertragung.—*Arch. f. Protist.* xxviii. 313.

—— (1913). Die Blutprotozoen des Wasserfrosches und ihre Übertragung.—*Ibid.* xxxi. 169.

—— (1920). Kleine Beobachtungen an parasitischen Protozoen. (Zugleich vorläufige Mitteilung über die Befruchtung und Sporogonie von *Lankesterella minima* Chaussat.)—*Ibid.* xli. 169.

Plate, L. (1914). Brief note on *Toxoplasma pyrogenes*, Castellani, 1913.—*Jl. Trop. Med. Hyg.* xvii. 98.

Reichenow, E. (1910) *Haemogregarina stepanowi.* Die Entwicklungsgeschichte einer Hämogregarine.—*Arch. f. Protist* xx. 251.

—— (1921). Die Hämococcidien der Eidechsen. Vorbemerkungen und I. Theil : Die Entwicklungsgeschichte von *Karyolysus.*—*Ibid.* xlii. 180.

Rocha-Lima, H. da (1912). Beitrag zur Kenntnis der Blastomykosen. Lymphangitis epizootica und Histoplasmosis.—*Cent. f Bakt.*, etc. 1 Abt. Orig. lxvii 233.

Roubaud, E. (1919). Un deuxième type d'hémogrégarine humaine.—*Bull. Soc Path. Exot.* xii. 76

Schüffner, W. (1911). Bemerkungen zu den von C. Elders auf Sumatra gefundenen Protozoenkrankheiten.—*Arch. f Schiffs- und Tropen-Hygiene.* xv. 394.

Sergent, Ed. (1921). Sur l'hypothèse de l'évolution des *Sarcocystis* du Boeuf chez un insecte hématophage, hôte définitif —*C. R. Soc. Biol.* lxxxv. 408.

Sergent, Ed. & Et. (1903). Sur un nouveau protozoaire, parasite ectoglobulaire du sang de l'homme.—*C. R. Soc Biol.* lv. 1163.

—— Ed. & Et., & Parrot, L. (1922). Sur une hémogrégarine de l'homme, observée en Corse.—*Bull. Soc. Path Exot.* xv 193.

Wenyon, C. M. (1922). Leishmaniasis : A Review of Recent Literature.—*Trop. Dis. Bulletin.* xix. p. 184.

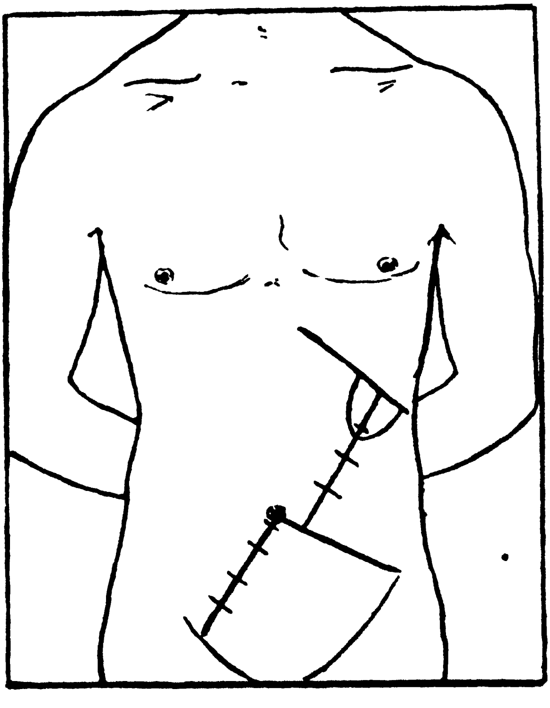
MALARIA.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE; TRANSACTIONS OF THE 4TH CONGRESS. 1921. Vol. 1. pp. 469-475. With 1 plate.—**Discussion on the Determination of the Splenic Index.** [SCHUEFFNER, CHRISTOPHERS & DE JONGE.]

MAXCY (Kenneth F.) & COOGLE (C. P.). **Methods for Determining Malaria Prevalence—the Spleen Rate of School Boys.**—*Southern Med. Jl.* 1923. Apr. Vol. 16. No. 4. pp. 269-275. With 1 chart. [5 refs.]

DARLING (Samuel T.). **Ascertaining the Splenic Index and the Mosquito Focus from School Children.**—*Jl. Amer. Med. Assoc.* 1923. Mar. 17. Vol. 80. No. 11. pp. 740-743. With 1 text fig. [5 refs.]

As Major Christophers puts it, speaking of the East, "The ease with which it [the splenic index] can be ascertained over large areas and for large numbers makes it a unique index in the measurement of disease, and to the malariologist it is one of the most precious assets of his science." Schueffner points out that its importance justifies the attempt to obtain a measure of the exposed spleen more accurate than that of finger-breadth, and suggests that a line should be drawn (see fig.) along the costal margin, another parallel to it through the



SCHUEFFNER'S method for determination of the splenic index.

[Reproduced from the *Transactions of the 4th Congress of the Far Eastern Association of Tropical Medicine.*]

umbilicus, and a third joining these at right angles through the apex of the spleen. This last line is divided into four equal parts, and the spleen is designated as 1, 2, 3 or 4, according as to the point at which its apex lies. By running downwards and to the right from the umbilicus another line, parallel to the first measuring line, a second index is obtained for classifying larger spleens. Christophers points out that the actual measurements of the size of the uncovered spleen are deceptive, overlooking stature, and suggests that the qualitative index should be in this respect relative, not actual. This condition Schueffner's index fulfils, but Christophers believes that it may be vitiated by the fact that as the spleen enlarges the umbilicus shifts, being, so to speak, pushed before the spleen, and that the length of its exposed portion compared with that of some other portion of the individual should be used. The stature may be taken, but it is suggested that the nipple-umbilical line would be most readily measured by a tape which had just measured the exposed spleen. A committee of five was appointed to make and correlate the thousands of measurements necessary to determine the most accurate and usable index. They will doubtless decide whether objection to using the umbilicus as a terminal in the nipple-umbilical line will not hold equally with Schueffner's marginal-umbilical line.

Maxcy and Coogle apply the spleen index, used quantitatively not qualitatively, to the south-east Missouri lowlands, and, comparing it with the history, parasite and Anopheles rates put to themselves two questions: Is it a measure of malarial prevalence? Is it large enough to be of practical use as such? The spleen rate was determined for 2,330 and the parasite rate for nearly 1,000 boys. Fifty per cent. of those showing parasites had enlarged spleens. Twenty per cent. of those having enlarged spleen showed parasites. The balance is held to be in favour of the splenic index, which was also found sufficiently large to be a practical factor in revealing malarial incidence. In communities, it is noted, sufficiently enlightened to ensure for themselves adequate medical treatment, the spleen rate will probably be low and afford an imperfect index of malarial incidence. It is held too as unlikely that where incidence is low the spleen rate in schoolboys will show small scattered foci ; and that it is probably not worth while to determine the splenic index unless 25 or more per cent. of persons questioned give a history of chills during the preceding season.

A discussion taken part in by FERRELL, BASS, RUSSELL, HEISER, BARBER, FRICKS and CARTER is necessarily valuable. The following points among others were stressed. There is need, as a necessary preliminary to an antimalarial campaign, of an accurate measure of malarial incidence and variation, the actual incidence in an ordinary community being incapable of ascertainment. The reliability of all indices depends upon experience in the examiner. In establishing a parasite index a house-to-house canvas may be valuable. What is not known about the splenic index in America would fill a large volume. There was clearly general interest in the possible value of this index in the United States.

Darling notes MANSON'S contention that the peripheral blood findings may represent but an overflow from much greater visceral events and questions whether the splenic enlargement, the result of such events, may not be as trustworthy a measure of malarial incidence as clinical histories or the blood smear, at least as this last is usually made. He carries the matter a step further. In a Brazilian village on the bank of the Rio Tiete, and straddling a small tributary, the splenic index of children in the two rows of houses nearest the river bank was 74, in the next five rows 26, in the next four rows 4, while further still from the river it was nil. Residence near the tributary stream (functioning as a sewer and too foul for Anopheles to breed therein) had no effect on the spleen rate. Guided by these facts, breeding-places were sought for, found and dealt with on the low land between river and village. The results, as indicative of the value of this line of intensive inductive reasoning, will be awaited with interest.

Clayton Lane.

PADUA (R. G.). [In English & Spanish.] **On the Incidence of Splenic Enlargements in a Malarious District of the Philippines. Sobre la incidencia de la esplenomegalia en un distrito malarico de Filipinas.**—*Jl. Philippine Islands Med. Assoc.* 1923. Jan.-Feb. Vol. 3. No. 1. In English, pp. 1–6. In Spanish, pp. 33–38. [1 ref.]

In Iwahig Penal Colony comparison was made of the splenic, parasitic, haemoglobin and hepatic indices, nearly always in healthy adult males. The second was reached after the examination of both thin and thick preparations. Although in 163 new-comers the splenic and parasitic indices were respectively 4·29 and 0, and in 1,228 old inhabitants 48·78 and 15·06, yet among these latter persons no relationship was demonstrated between any of the four indices. The season and duration of the investigation are not indicated. Of 186 parasite positives 79·03 per cent. harboured *Plasmodium vivax*, 11·82 *P. malariae*, 1·61 *P. falciparum*, 4·84 the first and second, 2·15 the first and third, and 0·54 the second and third.

C. L.

AIEVOLI (E.). **Iper-splenomegalia malarica e sue complicazioni.** [Excessive Splenomegaly and its Complications.]—*Riforma Med.* 1923. Jan. 29. Vol. 39. No. 5. pp. 104–105.

While the ordinary malarial enlargement of the spleen is without surgical interest, the writer has seen 17 cases with displacement, with or without torsion of the pedicle, acute, subacute or chronic; with infarction; with hydatid; with inflammation; or with traumatism.

C. L.

SEIDELIN (Harald). **Note sur le paludisme chez les Noirs.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 209–212.

It has been assumed in the Belgian Congo that although the whites suffered, often severely, from malaria, the negroes were immune after childhood. Seidelin, by instituting the regular examination of thick films, the only means in his opinion of reaching exactitude in an overworked laboratory, has shown a heavy percentage of infection in adult negro males. His treatment is 0·75 to 1 gm of quinine hydrochloride consumed daily at the dispensary while fever lasts; and quinine, arsenic, and sometimes strychnine, for as long afterwards as the man will come for treatment.

C. L.

GARIN (Ch.). **Evolution du paludisme contracté en Orient chez les sujets de retour en France depuis l'armistice.**—*Lyon Méd.* 1923. Mar. 10. Vol. 132. No. 5. pp. 187–193.

In 311 cases repatriated to France from Africa malarial parasites have never been found in the peripheral blood beyond the end of the second year. It is concluded that RIEUX's views are correct [this *Bulletin,* Vol. 20, p. 294], except that the period required for the natural death of the infection should be doubled. Visceral manifestations definitely attributed to malaria and occurring more than two years after infection (that is after infestation is presumed to have died out) are splenomegaly, gallstones, nephritis and continued accesses of fever; but though definitely attributed to malaria, they are held to constitute no claim to an invalid pension. It may be noted that as regards the original diagnosis no note is made as to its basis and no indication given of the kind of malaria in question; that the subsequent presence or absence of malaria is based "in all but certain cases" on thin smears; that these "cured" cases exhibit a mean of 18 per cent. of large and medium sized mononuclears; and that only 51 of the 311 men had after "cure" as many as 5,000,000 erythrocytes to the cmm.

C. L.

ROSAL (Irene). [In English & Spanish.] **Malaria in Children. La Malaria en los Niños.**—*Jl. Philippine Islands Med. Assoc.* 1923. Jan.–Feb. Vol. 3. No. 1. In English, pp. 11–15. In Spanish, pp. 43–47.

In detailing the recognized peculiarities of malaria in children, the lack of periodicity is particularly stressed, and, in the absence of parasites, the discovery of malarial pigment in a leucocyte, leucopenia, macrophagocytic cells in the peripheral blood, and, last, the quinine test. The dosage of quinine bisulphate for age in centigrammes, and given three times a day is: 1 year, 5; 3 years, 10; 10 years, 20; 13 years, 40. [1 grain being 6·5 centigrammes.]

C. L.

ROSAMOND (Eugene). **Malaria in Children and the Abuse of Quinin.**—*Southern Med. Jl.* 1923. Apr. Vol. 16. No. 4. pp. 252–255. [5 refs.]

To combat the local opinion that, in regard to malarial diagnosis, the percentage of laboratory findings is low in proportion to actual infections, Rosamond examined the hospital records of 300 cases diagnosed as malaria. These showed that in 291 of them parasites were found, while the others had already had quinine; but this finding clearly does not affect the doubt as to whether other cases, many or few, were missed. It is stated, "hereditary transmission of malaria does not take place." On the other hand the harm which may follow the indiscriminate administration of large doses of quinine to infants is instanced by striking cases. A baby of 9 months received 20 gr. of quinine in one day, with coma and apparent death; one of 11 months had taken 16–20 gr. and one of 17 months 30 gr. daily, both with constant vomiting. So that one views with sympathy his real aim, which is to show that the indiscriminate use of quinine with no attempt to diagnose malaria is to be deprecated.

C. L.

DELAMARE (Gabriel). **Aperçu historique sur le paludisme.**—*Rev. pratique des Maladies des Pays chauds.* 1923. Feb. pp. 3–14.

This excellent historic digest cannot satisfactorily be condensed; nor will some of its admirable phrases bear translation. It is insisted that we need much further knowledge in certain directions [a matter stamped through the pages of this *Bulletin*]. In view of DONOVAN's find of infected aborigines in the notoriously unhealthy "uninhabited" forests about Ootacamund, it does not seem wise to use this argument in support of the suggestion that man is not the only host of his malarial parasites.

C. L.

GILL (C. A.). **The Prediction of Malaria Epidemics. With Special Reference to an Actual Forecast in 1921.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1136–1143. With 2 charts.

CHRISTOPHERS, in 1911, and GILL [this *Bulletin*, Vol. 17, p. 131] have shown that there exists in Amritsar, Punjab, a correlation between the July–August rainfall and malaria later in the year. Whether malarial incidence over the whole Punjab during October could be predicted from the local rainfall in July–August was tested in 1921, Gill committing himself deliberately in this matter. "Although it is recognized that further study is necessary . . . it is thought that the first formal forecast of epidemic malaria in the Punjab attained a degree of accuracy which justified its preparation." A sufficiently restrained statement, seeing that when epidemic malaria arrived at certain localities, much as anticipated, it found, thanks to this forecast, special travelling dispensaries already established there. Possibly the sanitary department will be encouraged by finding in certain quarters the malarial outbreak attributed to these dispensaries.

C. L.

LEGER (M.), BÉDIER (E.) & BAURY (A.). **Index paludéen de diverses localités du Sénégal durant la mauvaise saison.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 208–214. [3 refs.]

In a number of children living in eight different stations in Senegal the parasitic index, estimated in thin smears, varied from 45 to 85, as compared with 63 in Dakar, the capital, and 71 in Medina, the adjacent native village. Of infections, *Plasmodium falciparum* occurred in 78·3 per cent., *P. malariae* in 21, and *P. vivax* in 0·7; the corresponding figures for Dakar being 66·4, 33·7 and 0·8. In many stations *P. vivax* was altogether absent from the findings. In the subsequent discussion, JOUENNE noted that the silk cotton tree can contain in its branches a cubic metre of water swarming with larvae, while the common "never-die" hedge always carries water at the origins of its branches.

C. L.

LEGER (M.), PINAUD (J.) & BÉDIER (E.). **Le Paludisme à Zinder: index hématologique.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 137–141. [4 refs.]

Zinder, the headquarters of the French Niger Territory, with a comparatively healthy reputation, showed a parasitic index, presumably in thin smears, of 68·8 in 250 children examined. Of the infected, 66·5 per cent. harboured *Plasmodium falciparum*, 0·5 per cent. *P. vivax*, 29·34 per cent. *P. malariae*, and 5·58 per cent. both first and last. Extensive borrow-pits minister to anopheline needs throughout the year.

C. L.

CHRISTOPHERS (S. R.) & HARVEY (W. F.). **Malaria Research and Preventive Measure against Malaria in the Federated Malay States and in the Dutch East Indies.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 759–771.

In coastal Java the breeding of *Anopheles ludlowi* in the economically important fish-ponds is the essential malarial factor, and has initiated the virtual movement of Batavia some miles inland to Weltevreden. In the Federated Malay States *A. umbrosus* is the coastal definitive host and can, it is held, be banished on flat land merely by clearing forest. On hilly ground the main definitive host is *A. maculatus*, breeding in connexion with seepage water, springs and streams. The effecting of its banishment lies in proper subsoil drainage, the method employed to accomplish this being that evolved by Malcolm WATSON. Through the red sandy loam of a ravine is cut a straight central drain 5 ft. deep, at the bottom of which are laid short, porous, earthenware pipes, 4, 6 or 8 in. in diameter. Their depth keeps them free of grass roots—a 12-ft. wide clearing, of tree roots—provided the drain is not on the flats. Similar drains branching from the main drain skirt the bottom of hill slopes, and are essential whether there be visible seepage or not. The pipes laid, these drains are, of course, filled. Open surface drains may also be essential in the soil (often turfed to prevent erosion) but they must not enter the zone of subsoil water or their permanently wet bottoms will ensure, instead of preventing, breeding of *A. maculatus*. They may have to be cemented, and usually the subsoil pipes make their final delivery into such a cemented open drain. Subsoil-drained land may be let out. Reclaimed flat land yields in Kuala Lumpur 3,000 dollars an acre. Reclaimed ravine land is usually agriculturally unproductive.

Cinchona cultivation in Java is considerable; 310 metric tons of quinine salts were exported in 1920, the British Empire taking about a third. To the possession of extensive plateau land with rich volcanic soil, a heavy rainfall at suitable altitudes, and the grafting of good yielding varieties of cinchona upon vigorous but poorer yielding stock, is ascribed Java's strong position. Sumatra's similar attempts have proved but little successful.

C. L.

DE SOUZA (R.). **A epidemia palustre das Fontainhas.** [An Epidemic of Malaria at Fontainhas.]—*Bol. Geral. Med. e Farmacia.* Bastora. 1922. Jan.–Dec. 8th Ser. Nos. 1–12. pp. 1–3. (Discussion pp. 3–5.)

At the meeting of the Medico-Pharmaceutical Association of Portuguese India, held on July 17, 1922, de Souza reported a local epidemic with these characters. The temperature nearly always rose to 105° or 107°; it was frankly intermittent; quotidian, tertian or double tertian in rhythm, yet of a benign nature; not yielding to quinine, but recovering after neosalvarsan in a dose of 0·45 gm. given irrespective of the temperature; attacking several persons in one family.

The evidence offered for the malarial nature of the epidemic is that in an unstated percentage of cases the laboratory found numerous gametes, generally those of the tertian parasite. [There is likely to be hesitation in accepting as malarial a frankly intermittent hyperpyrexia of good prognosis, unyielding to quinine, without schizonts in the blood and having such a markedly cohabitant distribution.]

C. L.

GODOY (Alcides) & PINTO (Cezar). **Estudos sobre Malaria.** [Studies in Malaria.]—*Brazil Médico.* 1923. Jan. 20. Year 37. Vol 1. No. 3. pp. 29–33. With 2 figs.

At Campos, in the State of Rio Janeiro, examination of the blood of 86 individuals for the presence of malarial parasites revealed 17 infected : 5 with *P. falciparum*, 4 each with *P. vivax* and *P. malariae*, 3 with both of these, and 1 with all three forms. The predominating species of Anopheles were *A. brasiliensis* and *A. argyrotarsis*, the former of which is said to convey quartan and malignant tertian, and *A. albimanus* transmitting the former only. *A. tarsimaculatus* was also found. Only 143 Anopheles in all were examined, and 59 of these were *A. brasiliensis* ; 1·6 per cent. were said to be infected. The numbers examined are too small for reliable inferences to be drawn from them.

H. Harold Scott.

[**Les travaux de la Commission yougoslave contre le paludisme; contributions à l'étude du paludisme dans le Royaume des Serbes, Croates, Slovènes.**—*Radovi antimalaricne Komisije, I et II; Prilozi za proncavanje malarije u nasim Krajevima*, Ministarstvo Narodnog Zdravlja S.H.S., Belgrad.] [Summarized in *Ann. d'Igiene.* 1922. Nov. Vol. 32. No. 11 pp 900-902.

The work of this Commission shows that the war in Macedonia left 40 per cent. of those serving there with malaria, generally tertian, but of a virulence greatly surpassing pre-war days, approaching in type that of Albania, and with a mortality of 4 per cent. *Anopheles maculipennis* comprises 12·5 per cent. of the entire mosquito population, *A. superpictus* also appearing. In Dalmatia 80·5 per cent. of the population is proved malarial, 51·02 with quartan, 18·4 with tertian, 25·27 with subtertian, and 5·85 with mixed forms. In 1921 much rain fell and the daily oscillations of temperature are said to have amounted to 40° C.

C. L.

TARASSÉVITCH (L.). **Expansion pandémique de la Malaria en Russie.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 71–74. [3 refs.]

In 1921 there were officially notified in Georgia (Russia) 300,000 cases of malaria against a normal annual mean of 25,000. In a part of Tiflis 5,179 cases and 486 deaths occurred among a population of 6,000. Baku registered 27,000 cases, with an infantile mortality of 40 per cent. Even in Petrograd an incidence of 15·2 per cent. was detected. These are but a few of the instances adduced, so that one cannot consider as exaggerated the estimate that 10,000,000 cases of malaria occurred in Russia during that year. The suggested causes are the movements of troops and fugitives, famine, what is with gentle euphemism referred to as the general profound crisis, with its practically absolute cessation of antimalarial effort, and the inadequate supply of quinine. There one may, with Tarassévitch, leave the facts to teach their own sufficiently terrible lesson.

C. L.

GORDON (J.). **Ueber das Auftreten der tropischen Malaria in Deutschland, ihre Epidemiologie und Beziehung zum Salvarsan.** [Cases of Tropical Malaria in Germany, their Epidemiology and Relation to Salvarsan.]—*Klin. Woch.* 1923. Mar. 5. Year 2. No. 10. pp. 442–444.

Analysing 31 cases of subtertian malaria, autochthonous in Germany, and appearing after the injection of salvarsan, Gordon points out that as a provocative of latent malaria one injection of this drug may suffice ; but that in the majority of the reported cases the malarial attack only showed after repeated injections ; and that the usual interval after the last injection was 8–15 days. He quotes the English experience in which malaria has been accidentally conveyed by an unsterilized syringe, and advocates control, summer and winter, of mosquitoes round hospitals, administration of quinine on a doctor's order only, and the examination of a thick-drop blood preparation in every case.

C. L.

ADLER (S.). **Malaria in Chimpanzees in Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 13–18. With 2 plates.

Of 13 chimpanzees recently examined in Sierra Leone, two only were infected with a malarial parasite, which was indistinguishable from *Plasmodium falciparum*, both morphologically in schizont and gametocyte, and in its effect upon the erythrocyte. Both animals were under two years of age, both were weak and thin, and both died. This evidence suggests that immunity is acquired in later life, and it is held that it supports REICHENOW'S suggestion that such immunity results after repeated attacks in early life. Since MESNIL and ROUBAUD (this *Bulletin*, Vol. 17, p. 146) failed to infect chimpanzees (a young male and an adult female) with human blood containing *P. falciparum*, and BLACKLOCK and ADLER (Vol. 19, p. 588) failed similarly in infecting adult man from chimpanzee, and *Anopheles costalis* from the chimpanzee, it is held that the relationship between human malaria and that of the chimpanzee is still unsettled. Crescents were scanty in both animals, as is the rule for man in Sierra Leone. The injection of 0·4 cc. of blood [a quantity presumably held to suffice under the circumstances, although its crescent content is not mentioned], blood which had been free of rings for 16 days, into another, presumably an older animal, was followed by no malaria in the recipient. The salient findings after death were fatty degeneration of the liver, a few schizonts in the spleen of one case, and a few crescents in the bone marrow of the other. One had an enormous infestation with an immature *Oxyuris*.

C. L.

i. Ioff (I.). **Phagozytose bei Malaria.**—*Rev. Microbiol. & Epidemiol.* Saratov. 1922. Vol. 1. No. 3. pp. 290–291. With 1 plate.
ii. ——. **Ueber Erkrankung an Malaria im Frühjahr.** [Malarial Attacks in Spring.]—*Ibid.* p. 292.
iii. —— & Rumjanzew (W.). **Die Malariaepidemie im Sommer 1922 in den Bezirken von Nowousensk u. Dergatschi.**—*Ibid.* p. 294.

i. Pigmented leucocytes were found in thick-drop preparations, rarely in tertian and quartan, but in about half the cases of subtertian malaria. Phagocytosis, by polymorphonuclears, is held to occur just before, or even after, death, so that, if the patient be still seeking a prognosis, it is of the gravest import. [The abbreviations and misspellings in the German summary do not facilitate the elucidation of the author's meaning.]

ii. Since attacks which are clinically primary occur during winter and spring, before the temperature has reached the height of 15° C. held necessary for development of plasmodia in the mosquito, Ioff considers them to be cases which for some reason have an excessively long incubation period. [One would put this rather as an alternative mode of expression than an explanation.

iii. The Saratov epidemic in 1922 affected 64·6 per cent. of the population, with a mortality of 1–2 per cent. In 129 thick-drop preparations the infection was subtertian in 86·6 per cent., tertian in 15·1, quartan in 3·5. In 6 cases infection was double.

C. L.

Velho (Assunção). **Um caso interessante de paludismo larvado. Ano de 1921.—Papeleta n.4 : 580, do H. de Loando.**—*Rev. Méd. Angola.* 1922. Sept. No. 3. p. 139.

A Belgian, 43 years of age, was admitted to hospital with muscular pains, drowsiness and general hebetude. He had been four months in Africa and in a tsetse fly district; the cervical glands were swollen. Forty-eight hours after admission he was semi-comatose with incontinence of urine, and had an attack of convulsions after which he improved somewhat, but next day again had incontinence of urine and of faeces also, and a syncopal attack from which he rallied. *P. falciparum* was found in large numbers in the blood. Quinine, 1 gm., was injected daily; the symptoms rapidly cleared up and the patient left hospital on the sixth day after admission.

H. Harold Scott.

Forbes (R. P.). **Congenital Malaria : Report of a Case in Colorado.**—*Amer. Jl. Dis. of Children.* Chicago. 1923. Feb. Vol. 25. No. 2. pp. 130–134. With 1 chart in text. [27 refs.]

A Greek woman had severe quartan malaria seven years ago. Two years later she reached the United States and has had no manifestation of malaria for the last four and three-quarter years. She was recently delivered of a 7-lb. child, which put on 2 lb. in the next seven weeks. It then experienced febrile attacks at intervals of 72 hours, and developed marked anaemia, with an enlargement of the spleen 2 in. below the costal margin, quartan parasites being present both in child and mother. Since Cockerell has found no anopheles in Colorado, it is held that they can be excluded as the cause of the malaria and that the case instances latent intrauterine infection. A bibliography of 36 cases is appended.

C. L.

di Pace (Ignazio). **Contributo allo conoscenza del valore di alcune mezzi fisici usati per la diagnosi della malaria latente.** [Some Physical Agents as Provocatives of Latent Malaria.]—*Gaz. degli Ospedali e delle cliniche.* 1923. Feb. 4. Vol. 44. No. 10. pp. 114–116.

Many detailed observations indicate that fatigue, hot and cold baths, splenic massage, general cold douche and solar irradiation have little or no value as provocative agents in the diagnosis of malaria, while the injection of 2–3 mgm. of nitrate of strychnine is held to act promptly and safely.

C. L.

Martone (Vincenzo). **Il chinino nelle gestanti malariche.**—*Gaz. degli Ospedali e delle cliniche.* 1923. Jan. 11. Vol. 44. No. 3. pp. 30–31.

Quinine was given in 36 cases of pregnancy. Among 9 women, to whom were given by mouth small and divided initial doses, no cause for anxiety arose ; among 15 given by mouth large initial doses abortion was threatened in 3, though all went to term ; among 12 given hypodermic quinine, 8 aborted, and 2 more showed threatening symptoms which subsequently disappeared. Unfortunately the actual dosage is mentioned in none of these cases.

C. L.

Ravaut (Paul). **Traitement du paludisme.**—*Rev. pratique des Maladies des Pays Chauds.* 1923. Feb. pp. 25–34. [3 refs.]

In the treatment of malaria it is recommended *ex cathedra* that quinine and arsenic be given alternately, each for two days. The quinine, however administered, is to be in daily doses of 2 gm. ; the arsenic, either in a single injection of 15–30 cgm. of novarsenobenzol on one of the two days, or an injection of cacodylate of soda on each of the two days, or 0·1 gm. of novarsenobenzol by mouth twice daily on each of the two days. The alternating treatment is to be continued for as long as is deemed necessary.

C. L.

Sergent (Et.), Foley (H.) & Catanei (A.). **Au sujet de l'élimination de la quinine absorbée sous forme de comprimés dragéifiés.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 21–22.

The writers have always found quinine tablets to be without the disadvantages so vividly expressed by Blanchard and so emphatically countered by other French writers [this *Bulletin*, Vol. 19, p. 872, and Vol. 20, p. 306]. Using for a dose a single ovoid, sugar-coated 20 cgm. tablet of the Algerian antimalarial service containing either sulphate or hydrochloride of quinine, they have made, with uniform results, seven experiments upon three persons. The test was by a freshly-prepared Tanret solution. In all of them evidence of excretion began in 2–2½ hours after ingestion, was at its maximum in 5–10 hours, and had disappeared in 27 hours.

C. L.

FILIPPELLA (Pietro). **Contributo allo studio sulla terapia della malaria con la cinconina.** [Cinchonine in the Treatment of Malaria.]—*Policlinico.* 1923. Apr. 9. Year 30. No. 15. pp. 464–470.

Twenty-three cases described in detail lead to the conclusion that for tertian malaria cinchonine in doses of 1·5–2·5 gm. can be substituted for quinine with therapeutic and financial benefit; that for subtertian malaria such substitution is advantageous in all but grave cases where rapid action is essential; and that a combination of quinine and cinchonine gives satisfaction.

C. L.

LAOH (Ph.). **A Simple Quinine Test for the Practice.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 266–267.

Four quinine tests are described, for use in urine:

1. Fluorescence. Precipitate chlorine by nitrate of silver. Add sulphuric acid to the filtrate. Although ZIEMANN states that in dilution up to 1 in 200,000 fluorescence appears, Laoh found it absent in 1 per 1,000.

2. Potassium-mercury-chloride. Solution A. Dissolve 27 gm. of corrosive sublimate in 1,500 gm. of hot distilled water; cool. Solution B. Dissolve, without heat, 100 gm. of potassium iodide in 500 gm. of distilled water. Mix A and B, and add 20 gm. of acetic acid; shake until the red precipitate entirely disappears. When added to quinine-containing urine a precipitate forms, soluble on heating, reappearing on cooling.

3. Thalleoquin. Make the urine, filtered and not too acid, yellow with bromine water; shake; run ammonia solution cautiously into the sloping tube. A green ring of thalleoquin forms between the two layers (soluble in alcohol, but not in ether) in quinine dilutions up to 1 in 7,500.

4. To cooled filtered urine add a few drops of picric acid. A cloudy, thin, diffuse opacity appears, disappearing on heating, and reappearing on cooling; whereas the precipitate of albumin increases on heating and falls on standing. It will be found effective when an adult has taken 0·2 gm. of quinine bisulphate an hour earlier, and is the test recommended for simplicity and effectiveness.

C. L.

SURBEK (K.). **Zilversalvarsan en sulfoxylat bij malaria.** [Silver-Salvarsan and Sulfoxylat in Malaria.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 6. pp. 741–745.

A recommendation of both drugs in treatment of benign tertian as well as subtertian fever. Sulfoxylat is a blood-isotonic, concentrated solution of salvarsan, ready for injection (single dose, 6–8 cc.). In crescent carriers an immediate effect was noted on the number of gametocytes circulating. In refractory cases the injection was followed immediately by the intravenous administration of 0·5–0·75 gm. quinine hydrochloride. The effect appeared to be lasting in 50 per cent. of the cases treated. In benign tertian cases fewer relapses were noted since this treatment was introduced.

W. J. Bais.

JUNGBLUTH (Julius). **Zur Behandlung der Malaria mit Silbersalvarsan.** [Treatment of Malaria with Silver Salvarsan.]—*Deut. Med. Woch.* 1923. Apr. 27. Vol. 49. No. 17. pp. 545–546.

In 18 cases in which "other illnesses were excluded by the blood picture," injections amounting to from 50 to 80 cgm. of silver salvarsan gave satisfaction. There are mentioned three acute cases, in which, however, 1·5 gm. of quinine were given on remission; 7 anaemic; and 6 quinine resistant cases. It is advised that blood be not allowed to mix with the chemical in the syringe.

C. L.

CHEINISSE (L.). **L'iode dans le traitement du paludisme rebelle à la quinine.**—*Presse Méd.* 1923. May 5. Vol. 31. No. 36. pp. 410–411. [1 ref.]

ROUBACHKINE, following other Russian physicians, has used 5–10 drops of a 10 per cent. tincture of iodine, or 25–30 drops of a 1 in 50 watery solution containing also 2½ parts of potassium iodide, in cases of malaria resistant to quinine. Fever was suppressed, but parasites, with no evidence of degeneration, persisted in the peripheral blood. Further, in two cases in which crescents persisted under quinine they disappeared when iodine was combined with it. Iodine may be combined with quinine in injections by using antipyrin as a solvent, thus: In a porcelain mortar grind 0·2 parts of iodine and 3·5 of antipyrin, adding water to 10. Make up to 100 with a 10 per cent. solution of quinine bihydrochloride. Inject 5–10 cc. of the solution. Cheinisse observes that in 1846 SÉGUIN had marked success with iodine in some quinine-refractory cases—and marked failure in others; while DE WILLEBRAND, in 1869, and DOUAUD, in 1871, strongly advocated iodine. He probably brings forward his observations in the hope that wider investigation may explain the great variations occurring after exhibition of a drug which has such far-reaching effects upon metabolism.

C. L.

CIGNOLINI (Pietro). **Tre mesi di campagna radioterapia antimalarica nel Veneto.**—*Ann. d'Igiene.* 1923. Jan. Vol. 33. No. 1. pp. 19–25.

Radio-excitation in malaria comprises the administration of minimal doses of X-rays, varying with the individual's susceptibility from one quarter of a second to 40 seconds. The minimum for each individual must be correctly estimated and must not be exceeded. The rays are held to dominate the fever, eliminate quinine resistance, improve appetite, nutrition, energy, haemoglobin and colour, reduce the spleen rapidly and destroy the parasites.

C. L.

ARESU (Mario). **La velocità di sedimentazione del sangue malarico.** [The Rate of Sedimentation of Malarial Blood.]—*Riforma Med.* 1922. June 26. Vol. 38. No. 26. pp. 601–603.

An interesting paper, difficult to condense. Linzenmeier's method was used in order that the results might be compared with those of other authors. Twenty cases were examined, all proven malarial, and the estimations were made in the apyrexial periods. In a patient who had had an attack the previous day the sedimentation time was 9 minutes; in one who had been free for a week, 40 minutes; another, free for 10 months, 2 hours and 40 minutes. Normal blood took 5 hours or more.

The author enters briefly into a discussion as to the part taken by the corpuscles and by the plasma, and shows that the question is an intricate one. Each of the following points has to be taken into account: the volume and mass of the red cells, the specific gravity of the whole blood, the viscosity, the specific weight of the citrated plasma, and the height of the column of the citrated blood in the haemocrite, and until we know the physico-chemical aspects of the relations between the plasma and the red corpuscles no definite conclusions can be drawn.

H. Harold Scott.

MAYER (Edmund). **Ueber Eisenreaktion am Malariapigment.** [The Iron Reaction in Malarial Pigment.]—*Virchows Arch.* 1922. Dec. 30. Vol. 240. Pt. 1–2. pp. 117–126. With 7 coloured figs.

SEYFARTH (*Verhandl. d. Dtsch. Pathol. Ges.*, 18 Tagung, Jena, 1921) has shown that tertian malarial pigment can be demonstrated to contain iron. The writer's beautiful figures show that using, in subtertian malaria, an acid alcohol solution of 2–5 per cent., instead of an acid watery solution, and allowing sufficient time for solution of the pigment, diffusion from it of iron can be demonstrated by Berlin or Turnbull blue. The reaction is capricious. Of adjoining cells one may show it, another not. Formol pigment does not so react.

C. L.

MONTEVERDE (Juan A.). **Los fenómenos coloidoclásicos y la patogenia del acceso palúdico.** [The Phenomena of "Colloidal Shock" and the Pathogeny of Malarial Paroxysms.]—*Cronica Med.* 1922. Sept. Vol. 39. No. 711. pp. 341–356. [11 refs.]

The author quotes authorities for stating that colloidal shock produced by intravenous injection of colloidal gold, colloidal silver, peptone solution, anti-plague serum, is accompanied by the same changes in the blood as occur in anaphylaxis, namely, after an interval of 15–30 minutes there is an increase followed by a diminution of blood-pressure, with leucopenia, an inversion of the relative proportions of the polymorphonuclear to the other leucocytes, and an increase in the coagulation time of the blood. The same phenomena were found to precede and accompany a malarial paroxysm, and the author holds that rupture of the parasitized erythrocytes, in setting free the merozoites, throws into the circulation heterogeneous colloidal bodies which give rise to a blood crisis (crisis hemoclásica) and anaphylactic phenomena.

H. Harold Scott.

ALLEN (A. H.). **The Problem of Malaria in Marines in Haiti.**—*U.S. Nav. Med. Bull.* 1923. Jan. Vol. 18. No. 1. pp. 25–31.

During seven years' occupation of Haiti by marines, drainage, screening and antilarval measures have had no perceptible effect on the malarial incidence and death-rate of these men. The type is morphologically benign and clinically grave. It is urged that the source of infection in each camp is the Haitian town close to which it stands; and that an effort should be made through the French priest and local authorities to induce the inhabitants generally to quininize themselves at the expense of the United States. The wisdom of concentrating attention on anopheline, to the exclusion of culicine, breeding-places is stressed. The routine treatment is by the administration of 60 gr. of sulphate of quinine daily. That the vomiting induced by this dosage has necessitated recourse to intravenous medication will probably occasion no general surprise. The avoiding of infection by placing, as in India, the cantonment at a reasonable distance from the town is not mentioned.

C. L.

SPENCER (H. A.). **The Treatment and Prevention of Malaria.**—*S. African Med. Rec.* 1923. Feb. 24. Vol. 21. No. 4. pp. 84–87.

" 'Hammer away while you live; *some* is bound to stick.' Is it true, I wonder?" a quotation in the last sentence of this paper, expresses adequately, and with the charm of varying metaphor, the attitude of one who has spent 20 years in trying to convince civil authority of the economic importance of malaria in the Transvaal. Nothing will, he is convinced, convert the scoffers but a local demonstration that adequate screening means absence of human malaria. Screen adequately and refuse to accept malaria as an adequate excuse for illness is his advice to the Government in its attitude to its servants, apparently irrespective of any duty which would force a man from the shelter of his home. Hostels, schools, hotels, boarding houses are, he points out, all capable of protection by government action, but its effectiveness depends on the users. In treatment, quinine with arsenic is advised and some success with "606" mentioned.

C. L.

i. RIEUX. **Le diagnostic du paludisme.**—*Rev. pratique des Maladie des Pays Chauds.* 1923. Feb. pp. 17–24. [1 ref.]

ii. MCCONNELL (Guthrie). **Positive Wassermann Test in a Fatal Case of Estivo-Autumnal Malaria.**—*Jl. Amer. Med. Assoc.* 1923. Apr. 21. Vol. 80. No. 16. p. 1123.

iii. SCHIFF (F.). **Ueber einige weitere Malaria tropica-Infektionen in Berlin.**—*Med. Klin.* 1923. Jan. 21. Vol. 19. No. 3. (945). pp. 84–87.

iv. PLETNEW (D. D.). **Ein Fall autochthoner Malaria tropica in Moskau.** [A Case of Autochthonous Tropical Malaria occurring in Moscow.] —*Arch. f. Schiffs- u. Trop. Hyg.* 1923. March. Vol. 27. No. 2. pp. 66–67.

v. FULCHIERO (Antonio). **Sindrome di Addison e malaria.**—*Policlinico.* Sez. Prat. 1923. Apr. 2. Vol. 30. No. 14. pp. 426–431. [11 refs.]

vi. STRAKOSCH (W.). **Zur klinischen Malariadiagnose.**—*Muench. Med. Woch.* 1923. Mar. 16. Vol. 70. No. 11. p. 327. [9 refs.]

vii. MAROGNA (Pietro). **Contributo allo studio della infezione malarica nella chirurgia.** [Malaria in Surgery.]—*Policlinico.* Sez. Prat. 1923. Apr. 16. Vol. 30. No. 16. pp. 498–499.

viii. HORSLEY, Jr. (J. S.). **A Type of Postoperative Fever, Probably Malarial Relapse.**—*Jl. Amer. Med. Assoc.* 1923. Apr. 14. Vol. 80. No. 15. pp. 1065–1066. [1 ref.]

ix. RICCI (Omero). **Relazione medica su di una campagna antimalarica nel suburbio di Roma.** *Policlinico.* Sez. Prat. 1923. Mar. 12. Vol. 30. No. 11. pp. 337–338.

i. In the main a résumé of accepted considerations; continuous re-examinations of thin films are preferred to thick drop preparations.

ii. A man with a history of chancre 25 years earlier, and several intervening attacks of gonorrhoea, but with no clinical symptoms, died of subtertian malaria microscopically established. There had been during fever a Wassermann reaction of four plus. The necropsy revealed definite syphilitic lesions of the aorta, with involvement of the aortic leaflets.

iii. Four further cases falling ill with subtertian malaria in Berlin, two of them after the administration of salvarsan, lead to a renewed warning to medical men to expect them.

iv. Plasmodia were detected. He had resided continuously in Moscow for two years.

v. Three cases showed cutaneous bronzing, particularly of the external genitalia and areolae, pigmentation of mucosae, an arterial pressure of 90–100 mm. of mercury, asthenia, nausea, anaemia, lumbar and abdominal pain, vomiting and diarrhoea. The evidence offered for their malarial origin seems to be that they reached the malarial section of a military hospital and that they recovered under quinine.

vi. Flattening of the umbilicus justifies a diagnosis of malaria.

vii. Two abdominal operations, the subjects of which developed severe manifestations of unsuspected malaria, microscopically established, lead to the conclusion that those who have previously suffered from malaria should receive quinine before operation.

viii. Several blood smears examined from each of three cases revealed no malarial parasites, although fever with chills had followed severe operations. Recovery followed quinine. There was a history of " malaria" 29, 40 and " a few " years earlier.

ix. The figures quoted for different years and different places do not all seem comparable, but the writer's conclusions are that preventive quinine is most efficacious when given not merely to those with fever, but in the interepidemic period.

C. L.

KALA AZAR.

SHORTT (H. E.). **Record of Kala Azar Research Work carried out at the King Edward VII Memorial Pasteur Institute, Shillong, during 1922.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1150–1168. [11 refs.]

The paper records the results of the following experiments :—

(1) Possible infectivity of faeces.
(2) Possible infectivity of drinking water.
(3) Inoculation of animals.
(4) Miscellaneous.

Under (1) experiments are described in which dogs, monkeys and birds were made to ingest the faeces of kala azar patients over long periods. Seven dogs received from 12–157 feeds, seven monkeys from 6–165 feeds and five birds from 28–153 feeds of kala azar faeces. In no case did any indication of a leishmania infection occur (one monkey was not examined).

Under (2) an attempt was made to test the possibility of animals becoming infected with leishmaniasis through imbibing water which was being used for drinking purposes by natives—the idea being that this water might be contaminated with the faeces of insects which harbour flagellates allied to leishmania. Five monkeys received from 92–95 drinks of the water ; two dogs 8 or 9 drinks and twelve birds from 3–87 drinks. In no case did infection result (one bird escaped before examination).

Under (3) a description of inoculation experiments on 13 monkeys, 1 dog, 4 pigeons, 1 porcupine and 3 mice is given. Of the monkeys, which were inoculated either with human or monkey material, 10 became infected. Of the other animals one mouse alone gave a positive result and this one had extremely numerous leishmania in its organs. Experiments with invertebrates are also described. Caterpillars, mealworms, cockroaches and spiders were inoculated into the body cavity either with cultures of *Leishmania donovani* or with emulsion of the organs of infected monkeys. All these experiments were negative as regards leishmania infection except in the case of one caterpillar which was found to have an infection of the body cavity fluid a week after the inoculation. There were present active single and dividing flagellates.

Under (4) are described :—(1) attempts to infect a toad by inoculation into the lymphsac of cultures of *L. donovani* ; (2) attempts to infect a toad by feeding it with cultures of *L. donovani* ; (3) attempts to infect a mouse by inoculating it with crushed up lice previously fed on a kala azar case ; (4) attempts to infect caterpillars, slugs, spiders and mantis with natural insect flagellates (a *Crithidia* of a bug, *Anoplocnemis* sp.) ; (5) attempts to infect a mouse with the excreta of bed bugs fed on kala azar cases. All these experiments gave negative results. [ZOTTA has successfully infected invertebrates with natural insect flagellates ; this *Bulletin* Vol. 19, p. 105.]

Details of a method for staining the cultural forms of *L. donovani* are described. It is also stated that the " thick tails " of *L. donovani* are developed in the bed bug as readily as those of *Leptomonas ctenocephali*. They most usually appear in the preparations some time after the dissection of the bug.

Some remarks on fallacies in connection with leishmania work are worth noting. *Nosema adiei* occurs in *Cimex rotundatus* and may lead to confusion with leishmania. The author notes that FRANÇA described in the salivary glands of plant bugs certain bodies which he regarded as the metacyclic or inoculative forms of the Euphorbia flagellate. It occurs to him that these bodies may in reality be Nosema like those occurring in the bed bug, which Mrs. ADIE mistook for leishmania. The structures figured by Mrs. ADIE as nematodes in the bed bug are probably closely coiled bundles of spermatozoa. As regards mice, the author describes as *Cryptococcus muris* a vegetable organism which he found in a considerable number of animals. It was oval or round, and measured, on an average, 4 by 2·1 μ. The bodies stained a dark blue and possessed a red dot resembling chromatin. Reproduction appeared to be by budding. The occurrence of these bodies in the tissues of mice raises doubts as to the nature of the uninucleated forms of flagellates described by FANTHAM and PORTER, and LAVERAN and FRANCHINI, as occurring in animals inoculated with insect flagellates. The organism is illustrated in the coloured plate and its resemblance to leishmania is evident. SANGIORGI (*Pathologica*, 1922, Aug. 15, No. 330, p. 495) has already described a Cryptococcus of mice which is possibly identical with the one noted by Shortt. Intestinal flagellates may readily escape from the intestine of mice if this is injured during post-mortem examination. In such cases smears of the organs frequently show these flagellates. The figures purporting to show *Giardia* in smears of the lung appear to the reviewer to resemble *Octomitus*.

C. M. Wenyon.

YOUNG (T. C. McCombie). **The Season of Onset of Kala Azar.**—*Indian Med. Gaz.* 1923. Feb. Vol. 58. No. 2. pp. 52–56. With 9 charts.

An enquiry into the time of onset of symptoms in cases of kala azar in various districts of Assam was undertaken with the object of obtaining information regarding the seasonal incidence of the disease. Histories of 5,011 cases were thus secured, with the result that an unexpected character revealed itself. There appeared to be two types of onset of kala azar, one of which occurs in the cold weather months in Nowgong and Sibsagar and the other in the hot weather months in the lower Assam Valley. It is suggested that these two types have somewhat different clinical characteristics and are possibly of different epidemiological significance in that they may be conveyed by different species of insects. The possible fallacies in the figures obtained are considered, but it is felt that the number of cases is large enough to eliminate any statistical error.

C. M. W.

NAPIER (L. E.). **An Analysis of the Clinical Picture in Kala Azar.**—*Indian Med. Gaz.* 1922. Nov. & Dec. Vol. 57. Nos. 11 & 12. pp. 406–412. With 3 figs.; 446–451. With 2 charts in text.

During the twelve months following March 1921 the author saw 581 patients which were diagnosed as kala azar or non-kala azar. Of these cases 362 proved to be kala azar. The history and clinical condition was recorded in detail, and the paper is an analysis of the information thus obtained. There are a large number of tables and charts illustrating the percentage of both kala azar and non-kala azar cases, showing any particular feature or symptom. The result suggests that although each point in the history and each clinical sign are individually of little value in arriving at a diagnosis the aggregate of evidence enables one to make a diagnosis with more accuracy than mere guessing.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part II. Dermal Leishmanoid.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 948–952. With 2 plates & 4 figs.

This paper contains a further account of one of the cases of dermal leishmaniasis described by the author in a previous report (this *Bulletin,* Vol. 19, p. 551). It may be recalled that the body of the patient was covered with nodules due to leishmania. In the present paper it is stated that cultures were obtained from the nodules and that a monkey inoculated in the eyebrows developed local nodular lesions. The human case was one of kala azar which had been treated by antimony compounds. The skin condition supervened. It was found that leishmania had disappeared from the internal organs. The inoculated monkey likewise appeared to be free from a general infection.

The histology of the lesions in the human case are described; they are very similar to those of oriental sore. It is stated that in smears from the nodules most of the parasites were extra cellular—the reverse of what occurs in oriental sore. [It is quite impossible to form an opinion as to the natural situation of parasites from the appearance of smears, for the cells are broken down in the process of preparing the film.]

C. M. W.

PANAYOTATOU (A.). **Quelques cas de splénomégalie et de kala-azar autochtones chez les indigènes en Egypte.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 843–853. [1 ref.]

PHILLIPS (*B. M. J.*, 23 July 1904, p. 195) was the first to record the existence of kala azar in Egypt. He saw two cases in Cairo. Two other cases were described by PETRITIS (*Iatriki Proodos,* June 1920) from Tanub in Upper Egypt. The present paper shows that of eight cases of febrile splenomegaly investigated by the author in Alexandria three were kala azar. The ages were 2, 14 and 15 years. The cases were treated with intravenous injections of tartar emetic and appeared to do well.

C. M. W.

CASTORINA (Giuseppe). **Cronaca della Leishmaniosi infantile a Messina e dintorni.**—*Pediatria.* 1922. Dec. 15. Vol. 30. No. 24. pp. 1173–1178. [1 ref.]

During the period October 1921 to September 1922 there were seen at the clinic at Messina 44 cases of kala azar in children. Treatment of these cases with intravenous injections of tartar emetic was undertaken, five in hospital and the others as out-patients: 24 were cured, 7 died, 6 were lost sight of, while 7 are still undergoing treatment. The details of the cases are given in tabular form.

C. M. W.

DE BUEN (Sadi). **Algunas consideraciones sobre el Kala Azar en España.**—Reprinted from *Rev. de Hig. y de Tuberculosis.* 1922. Oct. 31. Year 15. No. 173. pp. 253–259. With 1 map. [40 refs.]

The author reviews the records of the occurrence of infantile kala azar in Spain. He gives a list of 63 cases. It is not quite clear how many were diagnosed by spleen puncture, but apparently the majority were.

The disease has been recorded in practically all the provinces bordering the Mediterranean and also in the more central provinces—Madrid, Toledo and Caceres. The ages of the children varied from 6 months to 12 years and 52 of them were from 1–3 years old. C. M. W.

LABBÉ (Marcel). **Le kala-azar infantile d'origine française.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Jan. 18. 3rd Ser. Year 39. No. 1. p. 10.

The author draws attention to the case of kala azar described by RENAULT, MONIER-VINARD and GENDRON noted in the present number of this *Bulletin* [see below]. They believed the case to be the first reported from France, but other cases have been previously recorded. LABBÉ, TARGHETTA and AMEUILLE (this *Bulletin*, Vol. 12, p. 198) reported two cases, and D'ŒLSNITZ, BALESTRE and DAUMAS (this *Bulletin*, Vol. 19, p. 550) another.

The author states that he saw a case which was undoubtedly the same disease, though a diagnosis by spleen puncture was not made. The child recovered completely though no specific treatment was undertaken. If this case is included, five cases of infantile kala azar have been recorded from France, a fact which points to the disease being more common than has been supposed [the case reported by BIZARD and TERRIEN noted in this number makes a sixth]. C. M. W.

BIZARD (E.) & TERRIEN (E.). **Cas de leishmaniose interne chez une adulte, contracté en France.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 89–91.

Kala azar in adults who have never left France has not previously been recorded. The paper described a case in a woman 32 years of age who appeared to have contracted the disease at St. Nazaire, near Nice, where two cases in children had previously been noted. The diagnosis was made by discovery of the parasite after spleen puncture.

C. M. W.

MALLARDI (Mario). **Comportamento del sangue e degli organi emopoietici nella leishmaniosi sotto l'influenza della terapia.**—*Pediatria.* 1923. Mar. 1. Vol. 31. No. 5. pp. 230–246. [19 refs.]

The paper contains an account of twenty cases of infantile kala azar which were investigated from the point of view of the cells which occurred in the bone marrow, spleen and blood.

In infantile kala azar, as is well known, the blood shows three abnormal features—leucopenia, lymphocytosis and oligochromaemia. These are associated with the appearance in the blood of immature cells of various types, not only normoblasts and other cells of the red corpuscle series but also myelocytes. In certain cases the latter may be so numerous as to produce the impression of pseudoleukaemia. The presence of these cells is an indication of grave involvement of the haemopoietic organs. During the course of treatment the blood gradually assumes its normal characters. The disappearance of the cells of the immature type may be traced in cases which are responding to antimony. In certain cases the blood picture does not improve, while cells of the immature type become more numerous. In such there is little to be gained by continuing the injection of antimony tartrate. C. M. W.

NAPIER (L. E.). **Further Practical Experience with the Aldehyde Test.** —*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. pp. 104–107.

The author has made a further test of the aldehyde reaction (formol-gel test) in cases of kala azar [see this *Bulletin*, Vol. 19, p. 546]. He finds that the reaction can be relied upon to give a definite and correct diagnosis in all cases of more than six months' standing. In cases of under six months' standing a positive result can be accepted as evidence of the disease, whereas a negative result cannot be regarded as an indication that kala azar is not present. The results obtained show that of 119 cases in which the aldehyde reaction was positive spleen puncture revealed leishmania in 110. It has already been demonstrated that in the first spleen puncture smear from cases of known kala azar parasites were found in only 90·8 per cent. Of the 119 cases in which the aldehyde reaction was positive it would be expected from this figure (90·8 per cent.) that parasites would be discovered in the first smear in 108 of these. Actually they were found in 110, so that it is highly probable that all the 119 were cases of the disease.

C. M. W.

NASSO (Ivo). **La reazione di Brahmachari nella diagnosi della leishmaniosi infantile.**—*Pediatria.* 1923. Mar. 1. Vol. 31. No. 5. pp. 225–229. [2 refs.]

BRAHMACHARI stated that the blood serum of cases of Indian kala azar diluted with two to three times its volume of distilled water gave a flocculation which was characteristic of this disease [see this *Bulletin*, Vol. 12, p. 198]. The author of the present paper investigated the reaction in cases of Mediterranean infantile kala azar. He finds that it is of no value in the diagnosis of the disease, for not only is it difficult to interpret the results but the flocculation occurs with the sera of forms of anaemia other than those due to leishmania.

C. M. W.

SEYFARTH. **Eine einfache Methode zur diagnostischen Entnahme von Knochenmark beim Lebenden.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Dec. Vol. 26. No. 11. pp. 337–341. [4 refs.]

—— (Carly). **Die Sternumtrepanation, eine einfache Methode zur diagnostischen Entnahme von Knochenmark bei Lebenden.** [Trephining of the Sternum, a Simple Method for the Diagnostic Removal of Marrow in the Living Subject.]—*Deut. Med. Woch.* 1923. Feb. 9. Vol. 49. No. 6. pp. 180–181. With 1 text fig.

These papers describe a method of puncture of the sternum or ribs for obtaining bone marrow for diagnostic purposes. A small metal trephine with a crown 5·6 to 7 mm. in diameter is used. The skin over the sternum at the level of the third or fourth rib is incised for about 5 cm. down to the bone. The wound is kept open with an automatic retractor and the bone trephined by revolving the trephine with the fingers. Loss of resistance indicates a penetration of the cavity of the bone. Through the opening material can be extracted with a sharp spoon or platinum hook. The seventh or eight rib can be opened in a similar manner in the scapular line but the operation on the sternum is simpler.

C. M. W.

NAPIER (L. E.). **The Treatment of Kala-Azar by " Stibenyl." A Report of Ten Cases.**—*Lancet.* 1923. Feb. 10. pp. 280–283. [7 refs.]

The author gives an account of ten cases of kala azar treated in India with injections of stibenyl, nine by himself and one by MACKIE. The drug was prepared by Messrs. Allen & Hanburys, and was put up in ampoules as a powder, a " set " consisting of eight ampoules containing doses of from 0·1 to 0·8 grams. It was advised to give each dose intravenously in 2 per cent. solution in distilled water every other day to the total of 3·05 grams. The cases were treated on the lines suggested but in some the doses were smaller than those recommended, while the intervals were longer. Of the ten two were apparently cured, three died, while in the others the treatment gave no result and was discontinued in favour of sodium antimony tartrate, except in one case in which further treatment was refused. The reaction to the drug was in all cases bad. The statement accompanying the drug that it could be given intramuscularly to children led to a trial of this method. It was proved that such an injection could be very painful, in fact much more painful than intramuscular injection of other salts of antimony. It is concluded that the use of stibenyl in the treatment of kala azar has not been successful, that there is some factor other than that of the relative toxicity of this organic compound of antimony, and that this also probably applies to other complicated organic compounds, which should be used with the utmost caution. The curative effect of an antimony compound is not in direct proportion to its antimony content.

C. M. W.

RENAULT (Jules), MONIER-VINARD & GENDRON (Georges). **Kala-azar infantile d'origine française. Guérison par l'acétyl-p-amino-phénylstibinate de soude (Stibényl).**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Dec. 7. Year 38. 3rd Ser. No. 34. pp. 1624–1632. With 1 chart in text.

A child who contracted kala azar in Marseilles was treated with intramuscular and intravenous injections of stibenyl during a period of seven months. During the first three months injections were given every three days, and during the last four months every two days. The doses varied from 0·05 to 0·2 gm. and in all 14·76 gm. of the drug were given in 92 doses. A complete cure was obtained.

C. M. W.

NASSO (I.) & MALLARDI (M.). **Stibioresistenza e stibiointolleranza nella cura della leishmaniosi infantile. (Osservazioni cliniche e ricerche sperimentali.)**—*Pediatria.* 1923. Jan. 15. Vol. 31. No. 2. pp. 57–67.

Illustrating their remarks by a series of cases the authors draw attention to the fact that as in the case of arsenic-resistant trypanosomes and emetin-resistant amoebae so there exist antimony-resistant leishmania. This resistance may be primary or secondary. The former condition is acquired by the parasite before treatment is commenced, while the latter is the result of treatment with doses of the drug which are too small to kill the parasites or the use of a form of drug which is not easily assimilated. It is also noted that the host may be primarily or secondarily intolerant of antimony. In the first the patient reacts badly to injections from the start, while in the second this intolerance appears during the course of treatment. The authors claim to have demonstrated that in cultures in N.N.N. medium the antimony-resistant strains are able to develop in solutions of antimony which are stronger than those which the non-resistant strains will tolerate.

C. M. W.

YORKE (Warrington). **The Treatment of Kala-Azar by " Bayer 205."**—*Brit. Med. Jl.* 1923. Mar. 3. p. 370. [1 ref.]

A case of kala azar in an Indian was treated by rectal injection of tartar emetic in distilled water. This was followed by disappearance of the fever, improvement in the general condition, rise in the number of leucocytes and apparently a diminution of the number of parasites in the spleen. The spleen and liver had not decreased in size, while the patient's weight had continued to fall. It was then decided to treat the case with Bayer 205. Doses of 0·25, 0·5, 1·0 and 1·0 grams were given intramuscularly on December 28, December 30, January 2 and January 5 respectively. These caused no untoward symptoms but brought about a rapid diminution in the size of spleen and increase in the weight of the patient. On January 20 a spleen puncture revealed no parasites while the spleen, which had been below the umbilicus, now reached only to one and a half inches below the costal margin. The formol-gel test was, however, still positive. The patient sailed for India on January 30, apparently in excellent health and having put on 14 lb. weight in one month.

C. M. W.

YOUNG (Charles W.) & VAN SANT (Helen M.). *Leishmania donovani* **in the Peripheral Blood.**—*Proc. Soc. Experim. Biol. & Med.* 1923. No. 4. pp. 219–222.

The paper refers to investigations on kala azar in North China.

As human serum and human red blood corpuscles in culture media inhibit the growth of leishmania a technique was devised for ridding the material inoculated to the tubes of both of these. The cultures were made by taking 10 cc. of blood from the vein of the patient in a syringe containing 2 cc. of 1 per cent. citrated Locke's solution. The mixture was immediately expelled into a flask containing 50–70 cc. of the same fluid. The contents were then divided into two parts in two 50 cc. centrifuge tubes which were centrifuged (750 revolutions per minute) for five minutes. The fluid separated into a supernatant cloudy fluid and a deposit of red cells. The cloudiness is due to blood platelets and some red cells. Extracellular leishmania were sometimes found in smears of this fluid. The supernatant fluid was separated and centrifuged at 1,400 revolutions per minute for five minutes. The sediment was inoculated into tubes of N.N.N. medium having a P_h of about 7·6. With this technique 115 culture tubes were made from 34 blood specimens of untreated cases of kala azar. Thirty-one, or 91 per cent., were positive as regards development of flagellates. Cultures from treated cases did not give such a high percentage of positive results. From cases which had received up to a total dosage of 12 milligrams of antimony cultures were obtained in 60 per cent., while from cases which had received more than 20 milligrams of drug cultures were not obtained. Spleen puncture material from untreated cases gave a percentage of 91 positive cultures; treated cases which had received up to 12 milligrams of drug gave 77 per cent. positive cultures, while cases which had received over 12 milligrams of drug were uniformly negative.

The mononuclear and polynuclear leucocytes of the blood when they contain leishmania appear to be heavier than the other cells of the blood and are found at the lowest part of the sediment after centrifuging. Of twenty-seven smears of the sediment obtained from nine blood specimens of untreated kala azar cases intracellular leishmania were found in twenty-one. In treated cases the positive finds fell according to the quantity of drug which had been given.

C. M. W.

BANERJEE (Dhirendra Nath) & SAHA (Jugal Charan). **A Study of Blood Sugar in Bengalees in Health and in Kala Azar.**—*Calcutta Med. Jl.* 1923. Mar. Vol. 17. No. 9. pp. 109–114.

The paper, which consists mostly of a series of tables, gives the results of estimation of blood sugar in cases of kala azar and in normal Bengalees. It appears that in kala azar there is a fall in the sugar content of the blood, for in the normal Bengalees it was 0·103 per cent. while in kala azar cases it averaged 0·031 per cent.

C. M. W.

NICOLLE (Ch.) & ANDERSON (Ch.). **Conservation du virus de la leishmaniose canine sur les chiens dans les laboratoires.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 171–173.

Previous attempts to maintain a strain of kala azar in dogs has met with failure. A further attempt has shown that a strain can thus be maintained if the animals are given a sufficiently large dose, preferably of an emulsion of the bone marrow which in dogs is the tissue most heavily infected. Intraperitoneal injection of 6–8 cc. of an emulsion is sufficient to produce infection. The strain, which was that of naturally infected dogs, is now at its sixth passage.

C. M. W.

PEDROSO (Alex. M.). **Notes on the Biology of** *Leishmania tropica.*—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 47–58.

Having maintained cultures in N.N.N. medium of several races of leishmania during some years, the author was led to determine the optimum conditions of the medium. It was found that the best agar to use was made as follows :—

Water	1 litre.
Agar	20 gm.
NaCl.	3–4 gm.

To 8·5 cc. of this agar when liquid in a test tube at 45° to 50° C. are added 1·5 cc. of defibrinated rabbit's blood. By varying the reaction of the medium it was found that there is a relatively great range within which leishmania will develop. If the acidity or alkalinity is too marked the medium acquires a dark brown colour and is not favourable to growth.

C. M. W.

BIDAULT (R.). **Le bouton d'Orient au pays des dunes (Oued Souf, Sahara Constantinois).**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 92–93. [5 refs.]

LEGRAIN (1917) believed that the Souf district of the Sahara, about 220 kilometres south-east of Biskra, was free from oriental sore and that any cases seen there were importations. BAQUÉ (1921) believed that autochthonous cases did exist and in the present paper the author confirms BAQUÉ's statement. LEGRAIN's explanation that the disease was not present on account of the permeability of the soil and the absence of stagnant water, mosquitoes and fleas is thus incorrect.

C. M. W.

i. CHRISTOPHERSON (J. B.). **Leishmaniasis of the Skin resembling Lupus Vulgaris.**—*Proc. Roy. Soc. Med.* (Sect. of Dermat.). 1923. Feb. Vol. 16. No. 4. pp. 48–49. (Discussion, pp. 49–50.)

ii. ——. **Lupus Leishmaniasis : A Leishmaniasis of the Skin resembling Lupus Vulgaris ; Hitherto Unclassified.**—Reprinted from *Brit. Jl. Dermat. & Syph.* 1923. Apr. Vol. 35. pp. 123–131. With 3 text figs.

Both these papers deal with one of the two cases of oriental sore described by the author in a previous communication (this *Bulletin*, Vol. 20, p. 104). The typical sore had disappeared under treatment and in its place five months later there developed a series of nodules giving the impression of lupus. There was some doubt as to whether there was actually a superimposed tuberculous condition or whether the nodules were due to leishmania. The fact that a complete cure resulted from intravenous injections of tartar emetic points to the lesions being an unusual manifestation of cutaneous leishmaniasis.

The author remarks that oriental sore is not a local disease and cites, in support of this statement, the fact that one of the two cases developed a lupoid condition on the cheek while the original sore occurred on the arm. [It may be noted, however, that multiple lesions in oriental sore are common and that these do not necessarily appear at the same time. The possibility of autoinoculation cannot be excluded so that the author's statement cannot be accepted without some qualification.]

C. M. W.

KLOTZ (Oskar) & LINDENBERG (Henrique). **The Pathology of Leishmaniasis of the Nose.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 117–141. With 5 text figs. [20 refs.]

The authors describe the pathological changes which take place in the condition known as leishmaniasis of the nose as commonly seen in Brazil. It is always secondary to lesions on the skin. Involvement of the nose commences as an oedematous swelling of the cartilaginous part of the nasal septem. This swelling ulcerates and the condition spreads to other parts of the nasal cavity, finally extending backwards to the pharynx and downwards to the skin on the margins of the nostrils. Histologically there is primarily a perivascular lymphocytic infiltration of the submucosa. This is followed by a gradual increase in the number of plasma and endothelial cells, the latter finally forming aggregates or nodules. These nodules then necrose and become fibrotic. There is a marked endarteritis, while leishmania are present in the endothelial cells at all stages of the disease. [At the commencement of the paper the authors refer to the parasite as *Leishmania americana* and at the end as *Leishmania brasiliensis.* Actually the parasite is undistinguishable from *Leishmania tropica.*]

C. M. W.

HARTMANN-KEPPEL (G. L.). **L'appendicite à Leishmania.**—*Presse Méd.* 1923. Mar. 28. Vol. 31. No. 25. pp. 291–292.

The author states that in North Syria oriental sore patients often suffer from various intestinal symptoms, anaemia and splenomegaly, and that these are not explained by the occurrence of concomitant malaria. A case is quoted of a woman who had an oriental sore of eight months' standing. She was operated upon for acute appendicitis and the appendix was much inflamed. An examination of serum from part of the appendix showed typical leishmania measuring 1–3 microns, not only in large macrophages but also in lymphocytes and free. The free forms apparently measured 1·75 microns. Each contained a round nucleus and a short centrosome. The author next remarks that in no case was an undulating membrane present—a statement which is unfortunate, for it raises doubts as to his knowledge of what leishmania should actually look like. The size of the parasites is smaller than leishmania usually are, so that it seems to the reviewer that it is possible that the author was confusing yeasts with leishmania. He says a dog was inoculated with the serum from the appendix. Four lesions developed of which three were somewhat different from oriental sore. No mention of parasites in these lesions is made.

It seems that the author's conclusion that a leishmania appendicitis exists as a complication of oriental sore requires confirmation.

C. M. W.

TEJERA (Enrique). **La leishmaniosis americana en Venezuela. Memoria premiada por la Academia Nacional de Medicina (1918).**—46 pp. 1919. Caracas: Imprenta Nacional.

This paper contains an account of leishmaniasis as found in South and Central America, especially with reference to Venezuela. The disease in Venezuela does not appear to differ from that in other parts of South America. No new information regarding the disease or its parasite is offered though the paper includes a record of certain flagellates in arthropods and Euphorbias.

C. M. W.

CERQUIERA (Augusto de Castro) & DE VASCONCELLOS (Amarilio). [**La leishmaniose à Rio de Janeiro.**]—*Bol. Sanitario do Departamento nacional de Sáude Publica.*—1922. June. No. 1. p. 35. [Summarized in *Bull. Office Internat. d' Hyg. Publique.* 1923. Jan. Vol. 15. No. 1. p. 123.]

During the period May to August 1921, there appeared what was apparently an epidemic of cutaneous leishmaniasis in Rio de Janeiro. In all 26 cases were seen which came from certain streets in the Santa

Thereza and Sylvestre quarters of the town. The houses from which the cases came were occupied by 127 persons, so that of these 20 per cent. were infected.

The disease is known in the rural districts around Rio but it is exceedingly sporadic, so that it appears impossible to explain the sudden outbreak within the town.

C. M. W.

GASTOU & TISSOT. **Sur un cas de leishmaniose de la face.**—*Bull. Soc. française de Dermat. et de Syph.* 1923. Vol. 30. No. 1. pp. 40–41.

The paper describes a case of oriental sore successfully treated with intravenous and local injections of salts of antimony. Intravenous injections of novarsenobenzol and local injections of emetine hydrochloride had failed to bring about a cure.

C. M. W.

CASTELLANI (Aldo). **Treatment of Oriental Sore by Phosphorated Oil.**—*Brit. Med. Jl.* 1923. Feb. 17. p. 283.

The author advocates the treatment of oriental sore by the local subcutaneous injection of phosphorated oil (oleum phosphoratum B.P.). The oil (5 cc.) is taken into a syringe and injected into several places around and into the sore. This dose is repeated twice a week. Three cases are reported, the first being cured in six weeks, the second in three weeks, and the third in two months. The result in all three cases was very satisfactory, evidence of healing appearing after the second or third injection. It is essential to use only oil of recent preparation. The injections are practically painless but after a few hours there may be some local reaction, the lesion becoming slightly swollen and the skin reddened. The author remarks that he has used the oil in the treatment of rickets and osteomalacia and has given it as an adjuvant to quinine and arsenic in chronic malaria.

C. M. W.

LINDENBERG (A.). **Ueber die Behandlung der brasilianischen Hautleishmaniose mit "Bayer 205."** [Treatment of Brazilian Cutaneous Leishmaniasis with "Bayer 205."]—*Archiv. f. Schiffs- und Trop.-Hyg.* 1923. Vol. 27. No. 2. pp. 64–66.

The paper describes a series of cases of cutaneous and mucosal leishmaniasis treated with various doses of "Bayer 205." The conclusion is reached that the drug has a decided specific action on the purely cutaneous lesions but the details of the progress of the cases which the author gives do not appear to justify this optimistic estimate of the effects of his treatment.

C. M. W.

FRASER (A. H.). **Notice of a Form of Ulcer prevalent at Delhi.**—*Jl. Roy. Army Med. Corps.* 1922. Aug. Vol. 39. No. 2. pp. 138–139.

This is an interesting reprint of a report describing Delhi boil or ulcer published in 1860. The author ascribes the cases he met with to the use of water impregnated with salts, chiefly nitrates, and recommends change of climate as the best cure.

E. G. Graham Little.

i. De (Monindra Nath). **A Case of Kala Azar with Fatal Bleeding.** —*Calcutta Med. Jl.* 1923. Mar. Vol. 17. No. 9. pp. 120–121.
ii. Faber (Harold K.) & Schussler Jr. (Hermann). **Leishmaniasis in the United States. Report of the Third American Case of Kala Azar and of a Case of Oriental Sore.**—*Jl. Amer. Med. Assoc.* 1923. Jan. 13. Vol. 80. No. 2. pp. 93–97. With 5 text figs. [14 refs.]
iii. Roy (D. N.). **Personal Observations on a Few Cases of Kala Azar.** —*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. pp. 23–24.
iv. Gupta (B. M.). **Antimony-Fast Kalà-Azar**. [Correspondence.]—*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. p. 46.
v. Carrasco (Manuel Caeiro). **Revista sintética sobre as leishmanioses viscerais.**—Reprinted from *Med. Contemporanea.* 1922. 54 pp.
vi. de Buen (Sadi). **Apunte sobre la naturaleza de las células parasitíferas de los bazos leishmaniósicos.**—Reprinted from *Arch. de Cardiología y Hematología.* 1923. Vol. 4. No. 1. 2 pp. With 1 plate. [6 refs.]
vii. Sanjiva Rao (B.). **Kala Azar.**—Reprinted from *Madras Med. Jl.* 1923. Jan. & Mar. 56 pp. [9 refs.]
viii. Rodriguez Arjona (Vicente). [**Contribucion al estudio de las enfermedades tropicales. Leishmaniasis cutanea ulcerosa en la region oriental de la Peninsula de Yucatan.**]—*Soc. Méd, de Yucatan.* 1921. 8 pp. With 3 photographs. [Summarized in *Bull. Inst. Pasteur.* 1923. Mar. 15. Vol. 21. No. 5. p. 183.]
ix. Lambert (Robert A.). **Oriental Sore (Cutaneous Leishmaniasis) in the United States.**—*Jl. Amer. Med. Assoc.* 1923. Apr. 7. Vol. 80. No. 14. pp. 986–989. With 4 text figs. [5 refs.]
x. Plessier. **Observation d'un cas de leishmaniose cutanée (bouton d'Orient). Guérison par le stibényl.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Dec. 7. Year 38. 3rd Ser. No. 34. pp. 1609–1613. With 1 text fig.

i. A case of kala azar in a woman, age 18, was complicated by the presence of a sloughing ulcer in the mouth. The ulcerated surface commenced to bleed profusely and, all attempts to stop the haemorrhage having failed, the woman died from exhaustion.

ii. The paper records a case of kala azar and one of oriental sore in children in the United States. Both were imported from Europe and attention is drawn to the danger of allowing the entry of such cases into the country.

iii. This paper deals with 26 cases of kala azar seen by the author in Purnea in India, but gives no new information.

iv. The author draws attention to five cases of kala azar from which parasites were recovered after a full course (2–2·5 gm.) of tartar emetic had been administered over a period of three months.

v. This pamphlet of 54 pages contains a general account of the various diseases caused by leishmania.

vi. As a result of the examination of a spleen smear from a case of kala azar, the author agrees with Ferrata that the cells which contain the leishmania are typical haemohistioblasts. A coloured plate figures these cells.

vii. The paper, which does not appear to contain any new information of importance, is mainly a review of our knowledge of certain aspects of kala azar.

viii. The author records the presence of cutaneous leishmaniasis in the eastern part of the peninsula of Yucatan.

ix. A record of two cases of oriental sore in Armenians who emigrated to America. This brings the number of cases noted during the last two years to ten. In one case the lesion did not appear till three months after the patient's arrival in the United States, and probably eight months after infection.

x. A case of oriental sore treated by intravenous injections of stibenyl was cured in a period of four months, during which injections were made three times a week in doses of 0·2–0·6 gm., to a total of 8 gm.

C. M. W.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

KULESCHA (G. S.) & TITOWA (N. A.). **Die pathologische Anatomie und Ätiologie der Komplikationen des Ruckfallfiebers.**—*Virchows Arch.* 1923. Mar. 16. Vol. 241. pp. 319–351.

The severity of the epidemic of relapsing fever which led to the investigations described in this paper was due to the fact that many of the cases suffered from a combined infection with the spirochaetes and a bacillus belonging to the paratyphoid group. The bacillus, however, cannot be recognized as one of the known paratyphoid organisms, for it differs in certain biological characters, serologically and in the fact that it gives rise to severe and persistent infections. A septicaemia is produced and this is followed by the formation of emboli in the capillaries of the various organs, especially the glomeruli of the kidneys. At the site of an embolus there develops a round-celled infiltration of a granulomatous character which has a tendency towards suppuration. This particular type of paratyphoid infection has not been noted before and occurs only in association with the spirochaete of relapsing fever.

C. M. Wenyon.

CARNIOL (A.). **Cirrhose atrophique récurrentielle.**—*Presse Méd.* 1922. Nov. 4. Vol. 30. No. 88. pp. 952–953.

A woman who suffered from relapsing fever associated with jaundice had three attacks but did not recover as was expected; various abdominal symptoms appeared and she eventually died. At the post mortem the liver was found to be cirrhotic and it is suggested that the cirrhosis was directly due to the spirochaete. Other recognized causes of cirrhosis were excluded.

C. M. W.

KIREEFF (M.). **Arsalytbehandlung des Rückfallfiebers und der Malaria.** [Treatment of Relapsing Fever and Malaria with Arsalyt.]—*Münch. Med. Woch.* 1923. Feb. 23. Vol. 70. No. 8. pp. 244–245. [4 refs.]

Arsalyt (synthetic Bimethylaminotetraminoarsenobenzol) can be injected intravenously to human beings in dose of 0·3 to 0·7 gram. Tested on cases of relapsing fever it was found to produce as good results as neosalvarsan, so that it is a suitable drug for treatment of this disease.

C. M. W.

SÉZARY (A.) & POMARET (M.). **L'action spirillicide des composés arsenicaux 914 et 190 administrés par voie buccale.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Apr. 26. Year 39. 3rd Ser. No. 13. pp. 595–596. [2 refs.]

The authors have tested the preventive and curative action of the two drugs, 190 of FOURNEAU and 914 of EHRLICH, when administered orally to fowls inoculated with *Spirochaeta gallinarum.* In the case of 914, 16 centigrams are sufficient and 8 centigrams insufficient for preventing infection when administered a quarter of to half an hour after inoculation of the spirochaetes. The corresponding doses for 190 are 14 centigrams and 7 centigrams.

At the height of the infection on the third day 25–30 centigrams per kilogram of body weight are necessary to effect a cure in the case of 914, and in that of 190, 30 centigrams. It was previously shown that when administered intramuscularly 914 was definitely more active than 190, whereas given by the oral method the two drugs are equally effective. It is possible that the same rule will apply in the treatment of syphilis and that 914 given orally will not have the marked superiority over 190 which it appears to have when injected subcutaneously.

C. M. W.

JONESCU (A. P.). **Action du trépol dans la spirochétose des Oiseaux.**—*C.R. Soc. Biol.* 1923. Feb. 3. Vol. 88. No. 4. pp. 289–290.

A single intramuscular injection of trepol (a suspension in oil of sodium and potassium tartarobismuthate) in a dose of 0·5 cc. per kilogram of body weight is found to cure chickens, geese and ducks of spirochaetosis. The birds tolerate this dose well, no local lesion results and the cure is both sure and rapid.

C. M. W.

FARAH (Najib). **Castellani's Broncho-Spirochaetosis, Pneumonic and Asthmatic Varieties; X-Ray Examination; Treatment with Injections of Iodine.**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 2. Vol. 26. No. 7. pp. 103–110. With 3 text figs. [54 refs.]

After a review of the various types of bronchial spirochaetosis the author adds to the list a series of new types—broncho-pneumonic and pneumonic, pleuritic, asthmatic, foetid and gangrenous. These were all diagnosed as types of the disease owing to the presence of spirochaetes in the sputa. Though he rightly says that the organism resembles very closely the buccal and dental spirochaetes which occur in the normal state his remarks about their differential diagnosis are hardly convincing.

Examination of the lungs by X-rays shows various degrees of loss of transparency, a condition which the author says "might as well be taken for phthisis."

The author appears to disagree with those writers who consider that arsenic is a specific for this condition. On the other hand he finds that injections of iodine preparations give very satisfactory results.

[It appears to the reviewer that the paper is most unscientific and the author produces no evidence whatever that the conditions he describes are due to the spirochaetes in the sputum of the cases he has observed.]

C. M. W.

HOGUE (Mary Jane). *Spirochaeta eurygyrata.* **A Note on its Life-History and Cultivation.**—*Jl. Experim. Med.* 1922. Dec. 1. Vol. 36. No. 6. pp. 617–626. With 1 plate. [19 refs.]

The author describes the cultivation of *Spirochaeta eurygyrata* from human faeces. The best medium was obtained by adding 0·3 cc. of sterile serum water (pig serum diluted with three volumes of distilled water) to 15 cc. of 0·85 per cent. sodium chloride solution. The medium used varied in its P_h from 6·8–7·4 but P_h 7 gave the best results. After inoculation with a loopful of material the liquid was covered with a layer of paraffin to prevent evaporation. In this medium the spirochaetes lived and multiplied along with bacteria for 8–12 days at 35° C. Pure strains were obtained by taking small drops on a cover glass. When a drop was obtained in which only a single spirochaete was visible on microscopic examination the corner of the cover glass was chipped off and allowed to fall into a fresh tube of medium. The pure strains showed a remarkable range in the size of the spirochaetes. They varied in length from 4–56 microns. Some were loosely coiled and flexible, others were tightly coiled and less flexible. There were no terminal flagella and they all had rounded ends. Under the dark field there was a dark line running the entire length of the body. It is evident that one and the same species of spirochaete may show marked variations in its morphological characters and that separation of species is much more difficult than has been supposed.

C. M. W.

SANTOS (Gaspar). **Uma epidemia de tifo recorrente em Saurimo.** [An Outbreak of Relapsing Fever in Saurimo].—*Rev. Méd. Angola.* 1922. Sept. No. 3. pp. 139–142.

A record of an outbreak of relapsing fever, which showed no unusual features. It was apparently due to *Ornithodorous moubata,* which swarmed in the district.

H. Harold Scott.

i. MALLANNAH (S.). **Relapsing Fever in Raichur.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. p. 168.

ii. MEHTA (B. N.). **Notes on Relapsing Fever in Bhavnagar.**—*Ibid.* 1922. Dec. Vol. 57. No 12. pp. 456–457.

iii. LE FANU (G. E. H.) & O'BRIEN (A. J. R.). **An Outbreak of Relapsing Fever.** [Correspondence.]—*Brit. Med. Jl.* 1923. Apr. 21. p. 698

i. A record of an outbreak of relapsing fever during the winter months in the villages round Raichur, Hyderabad.

ii. A description of an outbreak of relapsing fever in India in which 23 cases occurred.

iii. A record of a small outbreak of relapsing fever during March of the present year at Accra.

C. M. W.

i. PAGNIEZ (Ph.) & RAVINA (A.). **Un cas de bronchite sanglante à spirochètes datant de quatorze ans.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Jan. 18. 3rd Ser. Year 39. No. 1. pp. 27–29. [1 ref.]

ii. HUIZENGA (Lee S.). **Bronchial Spirochaetosis.**—*China Med. Jl.* 1923. Feb. Vol. 37. No. 2. pp. 153–157; and *Amer. Jl. Trop. Med.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 143–149.

i. The author describes the case of a woman who had been in the habit of coughing up blood-stained sputum each morning for 14 years. The most careful examination revealed no objective cause for the condition, which gave rise to no fever or other inconvenience. The sputum showed a peculiarity in that it changed into a red liquid when allowed to stand. This change is described as a sputolysis. Spirochaetes were found in the sputum, and it is concluded that the case was one of long standing broncho-spirochaetosis. Treatment with various forms of arsenic had no effect.

ii. This paper describes the condition known as bronchial spirochaetosis as it occurs in North China. The disease was diagnosed as such by the discovery of spirochaetes in the sputum. Fowler's solution, four drops three times a day, has given the best results in treatment.

C. M. W.

RAT-BITE SPIROCHAETOSIS.

i. Row (R.). **Some Cutaneous Manifestations in Rat-Bite Spirochaetosis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Oct. 19. Vol. 16. No. 4. pp. 203–216. (Discussion, pp. 216–222.)

ii. Nixon (J. A.). **The Infecting Agent in Rat-Bite Fever.** [Correspondence.]—*Lancet.* 1922. Dec. 16. p. 1304.

i. Rat-bite fever appears to be very common in India at the present time. It has existed there for centuries for it is referred to in ancient writings. The disease commences with the primary lesion inflicted by the rat. This varies in extent according as it becomes septic or not. It may heal quickly or become an extensive sloughing area. The secondary eruption varies in quality and quantity. It may be merely an exanthem, or papules or nodules may appear on different parts of the body. The spirochaete is most easily obtained by puncture of the zone of the primary sore and inoculation of the fluid into a mouse. Monkeys and guinea-pigs can also be infected. There has been considerable difference in the various descriptions which have been given of the spirochaete. The Indian strain is a short, fine organism without terminal flagella. It possesses one and a half or two turns but rarely three. As it differs from many of the spirochaetes described as the cause of rat-bite fever the name *Spirochaete petit* was suggested for it.

The author points out that in the article on rat-bite fever in Byam and Archibald's "Practice of Medicine in the Tropics" he is wrongly quoted as having attributed the disease to a streptothrix.

ii. The writer of the second note states that he disagrees with Dr. Row that rat-bite fever is always caused by the small spirochaete. He has seen cases of the disease in which the only organism discovered in the blood is a streptococcus of low virulence.

C. M. Wenyon.

Kasai (Katsuya). **[A Comparative Study of Rat-Bite-Fever Spirochetes and Rat Spirochetes.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1922. Sept. No. 324. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 54.]

An investigation of the small spirochaetes which occur in rats has led the author to the conclusion that there occur in these animals two varieties. One of these, which he calls *Spirochaeta laverani* var. *morsus muris,* is the rat-bite-fever spirochaete and is virulent for animals, while the other is *Spirochaeta laverani* var. *muris* which is little virulent and is identical with the spirochaetes of albino mice and field mice. These conclusions are based on morphological and immunological studies.

C. M. W.

Mouchet & Guillermin. **Le premier cas de sodoku observé en Turquie.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Feb. 15. Year 39. 3rd Ser. No. 5. pp. 202–204.

The paper describes a case of rat-bite fever in Constantinople. The spirochaete was discovered in smears of the epitrochlear gland and also in a guinea-pig inoculated with gland emulsion.

C. M. W.

INFECTIOUS JAUNDICE.

BLANCHARD (M.), LEFROU (G.) & LAIGRET (J.). **Spirochétose ictérigène épidémique observée sur des indigènes à Brazzaville (Afrique Equatoriale Française).**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 184–193. [8 refs.]

This paper gives a fuller account of an epidemic of febrile jaundice which was briefly mentioned in a previous paper [this *Bulletin*, Vol. 20, p. 142]. The virus, which appears to be morphologically identical with *Leptospira icterohaemorrhagiae*, was recovered from the patients as well as from bugs collected in the beds. BLANCHARD and LEFROU (*loc. cit.*, p. 138) point out that they were able to transmit the virus from guinea-pig to guinea-pig by means of bed bugs even 38 days after the bugs had taken up the organism. Reference is made to NOC's account [this *Bulletin*, Vol. 17, p. 369] of the occurrence of Leptospira in the rats of Dakar. The virus was pathogenic to guinea-pigs, in which jaundice and haemorrhages occurred followed by death on the 21st day at the first passage, and more marked symptoms followed by death on the 36th day at the second passage. The third passage was not successful as the guinea-pigs failed to become infected.

The authors of the present paper had a similar experience with the virus obtained from a human case of the disease studied by them in Brazzaville. The Leptospira was passed successfully through four guinea-pigs, which became jaundiced and died in 25–29 days. At the fifth passage, though the animals became infected, there was no sign of illness and the virus was lost. The virus obtained from the bed bugs behaved in a similar manner.

It appears that the disease resembles Weil's disease very closely in its clinical features but there is strong presumptive evidence that it was conveyed by bed bugs from one human being to another, and this conclusion is supported by the successful transmission experiments conducted with bed bugs and guinea-pigs. In spite of the fact that Weil's disease does not appear to be insect borne, these authors consider there is not sufficient evidence to justify the conclusion that the epidemic jaundice of the Congo is caused by a distinct species of Leptospira.

C. M. Wenyon.

UHLENHUTH (P.) & ZUELZER (M.). **Ueber die biologischen und immunisatorischen Beziehungen des Erregers der Weilschen Krankheit** (*Spirochaeta icterogenes*) **zu der freilebenden Wasserspirochate** (*Spirochaeta pseudoicterogenes*). **(Zugleich ein Betrag zum Virulenzproblem.)** [Biological and Immunological Relations of the Organism in Weil's Disease (*S. icterogenes*) to the Free-living Water Spirochaete (*S. pseudoicterogenes*).]—*Arb. a. d. Reichsgsndhtsamt.* Berlin. 1923. Vol. 53. No. 2. pp. 525–542. (Reprinted from *Klin. Woch.* 1922. Oct. 21. Vol. 1. No. 43. pp. 2124–2131. With 3 charts.)

As has already been noted [this *Bulletin*, Vol. 20, p. 143] the authors have discovered in tap water a certain leptospira which resembles

Leptospira icterohaemorrhagiae both morphologically and in its virulence to guinea-pigs. With the object of testing the relation of the organisms occurring in Weil's disease and those in tap water anti-leptospira sera were prepared in rabbits. With these a series of experiments with cultures *in vitro* and in inoculated guinea-pigs were undertaken. The results are given in a series of tables. They demonstrate the close relationship of the organisms from the two sources and support the view of the water origin of Weil's disease. It is pointed out that the water leptospira has been found to be pathogenic for guinea-pigs only after its virulence has been enhanced in culture media. Direct inoculation of water to animals has never given rise to any symptoms. It is concluded that if such infections were possible Weil's disease would be much more common that it is and that some special condition must exist which enables the natural water form of the organism to gain a footing in a human being.

C. M. W.

VERVOORT (H.). **Spirochaeten bij acute koortsige ziekten van onbekenden oorsprong in de Tropen.** [Spirochaetes in Acute Febrile Diseases of Unknown Origin in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 6. pp. 697–707. With 2 charts & 2 plates.

During an epidemic of an acute fever of benign type associated with rheumatoid and vasomotor symptoms and occasionally with a terminal rash and jaundice, the author in a few cases demonstrated the presence of spirochaetes in blood films, in cultures, in horse serum diluted with Ringer's solution and once in a guinea-pig inoculated with the blood of a patient. In the cultures the spirochaete resembled *Leptospira hebdomadis* and *L. icterohaemorrhagiae.* Guinea-pigs are very susceptible to inoculation and they frequently succumb to the infection.

W. J. Bais.

VAN DE VELDE (E.). **Bloedspirochaeten bij koortsen en Spirochaetosis ictero-haemorrhagica.**—*Geneesk. Tijdschr. v. Nederl.- Indië.* 1923. Vol. 63. No. 1. pp. 153–163. With 6 charts and 14 figs. (English summary, p. 163.) [3 refs.]

VERVOORT [see above] isolated a leptospira which resembled *L. hebdomadis* from a case of unclassified fever in Sumatra. Repeated attempts were made to discover this organism in 430 fever cases admitted to hospital from July to October 1922. The organism was found in the blood of 23 of these, 9 of which had malaria and 2 typhoid fever. In the 12 cases in which no explanation of the fever could be discovered the illness lasted from three to five days. Only two of them had symptoms like those seen in fevers of the dengue group. No opinion is expressed as to whether the illness was actually due to the leptospira or not. The organism, which resembled a typical leptospira, is described and figured as possessing a fine membrane.

C. M. W.

COLES (Alfred C.). *Spirochaeta icterohaemorrhagiae* **in the Common Rat in England, with Remarks on the Minute Structure of these Leptospira (Noguchi).**—*Parasitology.* 1918. Nov. 20. Vol. 11. No. 1. pp. 1–9. With 1 plate. [11 refs.]

The author examined the kidneys of 100 rats taken in and around Bournemouth for *Leptospira icterohaemorrhagiae.* The organism was found in 91 of these. They were discovered by dark ground illumination and in stained smears. The material examined was obtained by making a thick emulsion of the kidney in a little saline solution. In order to stain the leptospira very thin films of this emulsion were made. When quite dry a few drops of distilled water previously made slightly alkaline were allowed to act on the film for 30 seconds. It was then stained in Giemsa without fixation for three or four hours. By this method the fine spirals were easily seen and these are illustrated in a series of excellent microphotographs. In the kidney of one rat a short spirochaete which appeared to be that of rat-bite fever was discovered.

C. M. W.

GRAPIOLO (F. L.), FOSSATI (V.) & PALAZZO (R.). **Un cas de Spirochétose ictéro-hémorragique.**—*C.R. Soc. Biol.* 1922. Feb. 18. Vol. 86. No. 7. pp. 414–415.

Though rats have not been proved to harbour *Leptospira icterohaemorrhagiae* in Buenos Aires in spite of repeated search, the human disease occurs there as illustrated by a fatal case described in this paper. The diagnosis was made by discovery of the leptospira in the tissues of the case itself and in inoculated guinea-pigs.

C. M. W.

APERT (E.) & BROCA (Robert). **A propos de deux cas de méningite lymphocytique avec issue favorable ; un cas spirochétosique et un cas de nature indéterminée.**—*Presse Méd.* 1922. Dec. 20. Vol. 30. No. 101. pp. 1093–1094. [21 refs.]

The paper describes two cases of meningitis in children which at first sight appeared to be tubercular. The fluid obtained by lumbar puncture contained large numbers of lymphocytes. The serum of one of the cases was proved to protect guinea-pigs against infection with *Leptospira icterohaemorrhagiae.* It is concluded that this was a meningeal form of Weil's disease. The nature of the other case is doubtful. Both children recovered.

C. M. W.

ANIGSTEIN (Ludwik). *Leptospira icterohaemorrhagiae* **in the Wild Rats of Warsaw.**—*Jl Trop. Med. & Hyg.* 1923. Mar. 1. Vol. 26. No. 5. pp. 81–82.

A record of the occurrence of *Leptospira icterohaemorrhagiae* in 4 out of 40 wild rats examined in Warsaw.

C. M. W.

YELLOW FEVER.

PIETER (H.). **Quelques réflexions au sujet de la fièvre jaune dans la République Dominicaine.**—*Rev. Méd. et Hyg. Trop.* 1922. Nov.-Dec. Vol. 14. No. 6. pp. 236-241.

No cases of yellow fever have occurred in the Isle of San Domingo since 1892. This disappearance of the disease, which up to that date had been more or less continuously present, has been entirely spontaneous and is unassociated with any sanitary measures or change in the habits of the people or the mosquitoes. Though the island has been in free communication during the past twenty years with Cuba and other districts where yellow fever has raged, and no quarantine precautions were taken, the disease was not introduced. The author concludes that there is some unknown factor which leads to the natural disappearance of the disease from a community.

C. M. Wenyon.

CONNOR (M. E.). **Notes on Yellow Fever in Mexico.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 105-116.

The paper is an epidemiological study of yellow fever in Mexico. The disease has been permanently endemic in Yucatán, Vera Cruz and Colima. There have been other centres, such as Campeche and Tabasco, but the disease eliminated itself owing to failure of susceptible human hosts as a result of commercial decadence. It is pointed out that commercial prosperity, which causes a constant influx of susceptibles, is one of the principal factors in maintaining the disease. Similarly in the plantations there will be true hacienda endemicity where crops are continuous and plentiful all the year round and fresh labour is constantly imported. Haciendas are frequently infected yearly during the harvest season. Economic depression has to be accepted as a factor which conduces to natural elimination of the disease, for the stationary population quickly becomes immune. Increase in transport facilities has been largely responsible for the spread of yellow fever in Mexico. Though it is admitted that babies are non-immune new comers, as yellow fever is essentially a place disease the author cannot see how children in the first three years of life play a vital part in perpetuating it. An interesting explanation of the increase of Stegomyia during the early days of the rainy season is given. Eggs which have been laid on the water's edge during the time that water is evaporating are left dry till the sudden rise due to rain, when they hatch in large numbers.

C. M. W.

CONNOR (M. E.) & MONROE (W. M.). **Stegomyia Indices and their Value in Yellow Fever Control.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 9–19. [1 ref.]

The authors claim that the continuance of yellow fever in any locality is due to the regular infestation of non-immunes rather than to the new-born. The latter factor certainly plays a part, but it is only a minor one. The active areas of the disease in an endemic centre are where both mosquitoes and non-immunes congregate, as in the districts of cheap lodging-houses and hotels. Endemic centres are of two kinds, the city centres and the farm or hacienda centres. In both these centres the disease is maintained through the arrival of non-immunes—which in the case of the hacienda centres is imported labour. When the non-immunes have become immune and when, through fear of infection, non-immunes cease to arrive the disease will automatically subside. The value of Stegomyia indices is discussed. The most valuable index is that of the container, the index being the percentage of containers harbouring mosquito larvae. When there is free breeding without control the index approaches 100. It is recognized, however, that the index in no way indicates the true percentage of adult mosquitoes which emerge.

C. M. W.

PERRIN (Tomás G.). **The Hepatic Lesions of Experimental Yellow Fever.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 27–38. With 10 figs. [16 refs.]

The author has studied the histological changes in the liver of guinea-pigs infected with *Leptospira icteroides*. He notes that two main types of lesion occur, viz., fatty degeneration or dystrophic steatosis, acute and profuse, and insular necrosis. The fatty change affects the whole parenchyma and nucleus of the hepatic cells and destroys extensive areas of the glandular tissue. This condition has never been described in human and experimental infectious jaundice, whereas it is analogous to that found in human livers from fatal cases of yellow fever. The insular necrosis is similar to that observed in guinea-pigs suffering from experimental infectious jaundice. The changes in the liver of guinea-pigs cannot therefore be used as an argument against the aetiological significance of *Leptospira icteroides* in yellow fever. The paper is illustrated with a series of microphotographs.

C. M. W.

HOFFMANN (W. H.). **Vergleichende Blutuntersuchungen an Meerschweinchen bei experimenteller Infektion mit Gelbfieber und Weilscher Krankheit.** [Comparative Blood Examinations in Guinea-Pigs experimentally infected with Yellow Fever and Weil's Disease.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1 Teil. Orig. 1923. Jan 30. Vol. 35. No. 5–6. pp. 488–502. With 19 charts in text. [2 refs.]

Having shown in previous papers that the histological changes produced in the organs of guinea-pigs by *Leptospira icterohaemorrhagiae* and *Leptospira icteroides* are identical, the author now publishes a detailed account of the changes undergone by the blood in these two conditions. In both infections the changes in the blood are the same, namely an increase in the number of leucocytes with a relative increase of lymphocytes and of the eosinophiles, heightened coagulability of the blood and rapid decrease in the number of the red blood corpuscles and quantity of haemoglobin.

These changes correspond with those seen in man in Weil's disease and are unlike those in cases of yellow fever. The author concludes that his experiments lend no support to the view that *L. icteroides* is the cause of yellow fever.

C. M. W.

LABORATORY METHODS.

ALPORT (A. Cecil). **The Blood Count. Improvements in Method.**—*Lancet.* 1922. Oct. 7. pp. 756–758.

In this communication it is recommended to use an accurately ground cover glass 3·8 mm. thick (obtainable from Messrs. Hawkesley & Sons, Wigmore Street, London, W.) in place of the thinner cover slips ordinarily supplied with counting outfits of the Thoma-Zeiss type. The thickness of the cover glass necessitates the use of a low power lens of good working distance ; but, combined with an 18 compensating eyepiece a $\frac{2}{3}$ in. objective gives an excellent field for counting although the squares are slightly smaller than in the ordinary method.

It is pointed out that pipette, counting slide, and cover glass must be absolutely clean and dry, and solutions filtered ; and that, in order to obtain even distribution of the cells on the counting slide, speed in taking the blood, rotation and vigorous shaking of the pipette, care to discard the fluid in the capillary tube which contains no corpuscles, and rapidity in applying the cover glass are essential. All that is claimed for the thick cover glass method is that it assures absolutely accurate contact (shown by perfect Newton's rings all round the counting chamber), that the depth of the counting chamber is exactly $\frac{1}{10}$ mm. all over (no buckling of the thick cover glass being possible), that with a $\frac{2}{3}$ in. objective and an 18 compensating eyepiece the field is an excellent one, and that, being quick and easy, valuable time is saved by its use.

J. D. Thomson.

i. JOFF (I.). In Russian. [Abridged Version in French.] **Sur la méthode d'examen du sang dans la goutte épaisse.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1922. Vol. 1. No. 1. p. 75.

ii. SINTON (J. A.). **A Possible Fallacy in the "Thick-Film" Method of Examination for Malarial Parasites.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 592–594.

i. As a simple, quick and convenient modification of the "thick-drop" method of examining the blood for diagnostic purposes, the author of the paper under review recommends the following :—Allow the drop (or thick smear) of blood to dry on the slide. Dissolve out the haemoglobin with 1 per cent. acetic acid, pouring (not washing) off the acid containing the dissolved haemoglobin. Allow the preparation to again dry thoroughly in air and then stain for 2–5 minutes in a mixture of 1 per cent. methylenblue (5–7 parts), 1 per cent. carbolfuchsin (1 part), and water (10–15 parts) ; or in some other suitable staining mixture.

The author claims good results with this method in relapsing fever, and thinks it may be useful in the leucocyte count and in the cell-diagnosis of exudates ; but in this abridged version reference is chiefly made to its use in malaria in which he says "it deserves to be more widely employed" and "cases of malaria in which no parasites are found are rarely met with in examinations of the blood by the thick-drop method." [The reviewer thinks that a word of caution should accompany these remarks about malaria. The "thick-drop" method may facilitate the search for such distinctive forms as crescents when these are very scanty ; but used as a routine measure, unchecked by the examination of thin films, it will more often lead the inexperienced into diagnostic errors. A much more satisfactory, and a quite expeditious, method is to smear well-stained ordinary thin films with a thin layer of cedar-wood oil and to examine these with a good dry lens, such as an 8 mm. apochromatic in combination with an 8 or 12 compensating eye-piece. With this combination a slide may be examined much more quickly than with an oil immersion lens, and even the smallest ring forms can, with a little practice, be readily recognized, and, if necessary, the diagnosis may be confirmed by turning on the oil immersion. Time may further be saved by running along the upper and lower margins before examining the rest of the smear.]

ii. Another possible source of error is pointed out in this note. While routine blood examinations of malarial cases undergoing treatment were being carried out in the author's laboratory one day all the thin films were returned as negative and all the " thick " films as positive. The thick films had been dried in air, dehaemoglobinized with distilled water, fixed in methyl alcohol, and stained in Giemsa. The distilled water used on this particular day had been stored in bottles for some time, and was afterwards found to contain ciliates and flagellates. These protozoan organisms had apparently got entangled in the loose meshes of fibrin, while the " thick " films were being dehaemoglobinized, were afterwards fixed in the methyl alcohol and stained in the Giemsa, and had been mistaken for malarial parasites. The author remarks that " the fallacy might occur very easily during the hot weather in the tropics." [This particular fallacy may, of course, as the author points out, be avoided by using sterile bottles and freshly prepared distilled water, or distilled water tested and found free from organisms ; but the mere fact of these organisms having been mistaken for malarial parasites in the " thick films " by workers presumably not altogether inexperienced shows that it is not always safe to rely on the " thick drop " method alone for the recognition of malarial parasites.]

J. D. T.

ROMBY (Paolo). **Studi sulla Malaria.** [Studies in Malaria.]—*Giorn. di Med. Milit.* 1922. Oct. 1. Vol. 70. No. 10. pp. 449–460. [25 refs.]

A method of staining blood films is described at pp. 458–459 in which methylene blue is rendered polychrome by mixing an alcoholic solution of the dye with an acid carbonate of calcium. Three solutions are used :—(1) *Fixing Fluid.* To 30 cc. of absolute alcohol are added 4 drops of a 1 per cent. solution of picric acid in alcohol and 1 drop of glacial acetic acid. For dropping a capillary tube of 3 mm. diameter is used.

(2) *Stain.* Methylene blue, 60 cgm. ; absolute alcohol, 30 cc. ; 0·01 per cent. caustic potash, 100 cc.

(3) *Calcium solution,* which must not be more than three or four days old and is to be added to the stain at the time of employment. A stock solution containing 1 decigramme of bicarbonate of sodium and 2 decigrammes of carbonate of calcium in 100 cc. of distilled water is made ; of this 4–5 cc. are added to 100 cc. distilled water just before use.

The process of staining is as follows :—The film is fixed by covering it with picric-acetic solution for 10 minutes and then immersed in the staining fluid freshly prepared by mixing 20 drops of the methylene blue solution with 40 cc. of the solution of lime, well shaken. The film is allowed to remain in this for one minute, then rapidly treated with a weak solution of acetic acid, 1 drop in 100 cc., washed and dried.

The erythrocytes stain a more or less intense yellow, the cytoplasm of the parasites stains blue, the chromatin red or reddish violet, the protoplasm of the leucocytes blue, their nuclei violet, the granules deep blue or pink, and the platelets red.

H. Harold Scott.

FELICE (Durand). **Un nuovo metodo di colorazione vitale del sangue.** [A New Method of Vital Staining of Blood.]—*Riforma Med.* 1922. Sept. 18. Vol. 38. No. 38. p. 893.

Saturated solutions of brilliant cresyl-blue and Sudan III are made separately and an equal volume of pure glycerine is added to each. After filtration the two solutions are mixed and alcohol to 2 per cent. is added. The author claims that this stain is especially good for observing the Sudanophilic granules, and for the ortho- and meta-chromatic substances of the red corpuscles.

H. Harold Scott.

LYON, Jr. (M. W.). **A Simple Method of using Giemsa's Blood Stain.** —*Jl. Amer. Med. Assoc.* 1923. Feb. 17. Vol. 80. No. 7. p. 473.

This may be a useful method to the practitioner in staining occasional slides for diagnostic purposes. It is simple, convenient, and saves time and stain when only one or two slides have to be stained. The dried blood film is fixed in methyl alcohol for about a minute and again allowed to dry. The film is then covered with distilled water and from 3–5 drops of Giemsa's stock solution are added at different points. The slide is then gently rocked to ensure uniform mixture of the stain and water without overflowing the sides of the slide. The mixture is allowed to act for about 15 minutes and is then flushed off and the slide washed in distilled water until the film assumes a pinkish colour.

[If distilled water is not available, rain or tap water may be used; and if methyl alcohol is not procurable, absolute alcohol, or equal parts of alcohol and ether, may be substituted, though the results may then be not quite so sharp and clear.]

J. D. T.

GIEMSA (G.). **Das Wesen der Giemsa-Färbung.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Nov. 18. Vol. 89. No. 4/5. pp. 99–106. [14 refs.]

A paper by UNNA with the same title is referred to in this *Bulletin*, Vol. 19, p. 787. Giemsa's views on the subject differ substantially from those expressed by UNNA. In the present communication, and in order to elucidate the points at issue, he puts two questions and then discusses how UNNA and he would answer them.

1. Is Azur by itself able to give the typical Romanowsky-Giemsa, bright-red colour reactions of the nucleus, or is Eosin necessary for this and is it tinctorially concerned in the colouring?

2. How is one to explain the "metachromatic" action of Azur which, among other things, shows itself in the nuclei being stained by this dye, even without the addition of Eosin, red-violet, and the mast-cell granules pure red, while the rest of the cell appears blue?

Giemsa says that UNNA, in attributing the typical red-reaction solely to Azur, confuses, or fails to distinguish between, the bright-red Romanowsky colour and the "metachromatic" violet, or red-violet reactions of the nuclear substance. Azur by itself stains the nucleus "metachromatically" blue-violet or red-violet; but to obtain the typical bright-red Romanowsky reaction the presence of the Eosin is necessary. This typical reaction is also obtained by successive staining, first with the basic dye (Azur) then with the acid (Eosin), but not in the reverse order. These results, Giemsa holds, show that the basic dye alone is unable to give the typical bright-red nuclear reaction and that the Eosin is not only indispensable but participates "tinctorially" in its production. He looks upon the process as one of "mordant-dying" in which a colour base (azur base) mordants the acid nucleus so that ultimately it can take up a colour acid (Eosin acid) to which, unmordanted, it has scarcely any affinity. Similarly, when the Giemsa stock solution is largely diluted with water, the Azur II Eosin, he suggests, becomes dissociated and the basic dye (Azur) mordants the acid nucleus so that it takes up the acid dye (Eosin).

The metachromatic action of the Azurs, which expresses itself not only in the red-violet staining of the nuclear substance but also in the pure red colouring of mastcell granules is, he considers, explained more naturally by the tendency of these dyes to "Tautomerism" than by UNNA's assumption that it is due to the red anhydride of Azur, or the red anhydrides of its components.

Although it is the methylenazur, not the methylenblue, that shares in the production of the typical bright-red nuclear reaction, the presence of methylenblue in the Giemsa stain is nevertheless advantageous because it colours the cytoplasm of the cell deeper, and of a purer blue, than Azur alone, and in this way it contributes substantially to the picture as a whole, and to good differentiation.

J. D. T.

WARTHIN (A. S.) & STARRY (A. C.). **The Staining of Spirochetes in Cover-Glass Smears by the Silver-Agar Method.**—*Jl. Infect. Dis.* 1922. June. Vol. 31. No. 6. pp. 592–600. With 8 text figs.

The authors believe that the method which they here describe of demonstrating spirochaetes in cover glass smears is "the surest and safest diagnostic method yet devised." They recommend it to "bacteriologists and laboratory workers engaged in spirochaete studies," but "its greatest value," they consider, "is in its application to the clinical diagnosis of syphilis."

Full directions are given and these should be carefully followed by anyone wishing to acquire the method. They cannot be usefully summarized.

Eight figs. accompany the paper. These show photomicrographs of (1) *Spirochaeta pallida* in smear from chancre. (2) Two types of spirochaetes, the ones most commonly mistaken in the dark-field for *pallida*, in smear from gums. (3) *Spirochaeta obermeieri* in smear of rat's blood. (4 and 5) *Spirochaeta icterohaemorrhagiae* in smear from old culture. (6) *Leptospira icteroides* in smear from guinea-pig's liver. (7 and 8) Ditto in smear from macerated guinea-pig's liver.

J. D. T.

i. KOFOID (C. A.). KORNHAUSER (Sidney S.) & SWEZY (Olive). **Technique for Staining the Amoeba with Iron Haematoxylin.**—*China Med. Jl.* 1922. Sept. Vol. 36. No. 5. pp. 406–407.

ii. SHORTT (H. E.). **Note on Iron Haematoxylin Staining.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. p. 836.

i. Though adding nothing to the usual technique, a clear and concise account of procedure for the selecting, smearing, fixing, staining and mounting of material is here given.

ii. In this note the following procedure for preparing a haematoxylin solution that can be used immediately (*i.e.* without having to wait for it to "maturate") is described :—

> "To 95 cc. of distilled water in a flask one adds 1 gm. of pure haematoxylin crystals (Grubler for preference). This solution [mixture] is slowly brought to the boiling point, with occasional shaking to complete solution of the haematoxylin, and at this stage 5 cc. of pure carbolic acid, liquefied if necessary, are added."

When cool the solution is ready for use. It is said to keep indefinitely and to possess staining properties equal, if not superior, to those of the solution matured in the usual way.

J. D. T.

MALONE (R. H.). **A Fallacy in the Use of Benian's "Relief" Stain associated with the Growth of Micro-Organisms in Two per cent. Aqueous Solution of Congo-Red.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 847–849. [1 ref.]

The author refers to a previous paper in which he described a method of demonstrating the capsule of the pneumococcus by a modification of Benian's relief stain [see this *Bulletin*, Vol. 19, p. 769] in which a 2 per cent. aqueous solution of Congo-red is used ; and he now draws attention to the fact that in this solution certain micro-organisms, one of which is a capsulated cocco-bacillus resembling the pneumococcus, can grow quite readily. To obviate errors from such a source, the Congo-red solution may be autoclaved, have phenol up to 0·5 per cent. added to it, and kept in sterile tubes from which it may be transferred to the slide by means of a sterile platinum loop.

J. D. T.

EMILE-WEIL (P.) & ISCH-WALL (P.). **Présentation d'une seringue à transfusion sanguine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Nov. 23. Year 38. 3rd Ser. No. 32. pp. 1537–1538.

The description given is that of a simple syringe with a capacity of about 100 cc., fitted with finger pieces, and constructed so that it can be easily manipulated with one hand. It has a lateral canal to which the needle is fitted direct. When in use the weight of the syringe is supported on the recipient's forearm, the needle held firmly with the fingers of the left hand, while the right is left free to manipulate the piston. Having no stopcock, nor attachment of any kind, nor any part where stagnation might occur, the risk of coagulation is reduced to a minimum.

J. D. T.

MATTHEWS (J. C.) & PEARSON (C. V.). **The Lymphoidocyte and the Türk Cell: their Haematological Relationships and Clinical Significance.**—*Lancet.* 1922. Oct. 28. pp. 909–913.

In this article the authors begin by giving, under technique, a description of the "panoptic" stain (Jenner followed by Giemsa) which they used for staining their blood films in differentiating the various cells they refer to. They also compare in tabular form the appearances obtained by the use of Leishman, Jenner, Giemsa, and "panoptic" stains separately. After this they give short definitions embodying what they consider to be the distinguishing characters of the "Lymphocyte," "Mononuclear," "Lymphoidocyte," "Erythroblast," and "Türk cell." In the present confused state of blood cell nomenclature this is necessary to prevent misunderstanding and confusion. A table is also introduced summarizing and bringing into juxtaposition the chief points concerning the "Lymphoidocyte," "Türk cell," "Lymphocyte" and "Erythroblast."

The conclusions they come to regarding the subject matter indicated by the title of the article are :—

"1. That the use of the term lymphoidocyte should be limited to the primordial cell from which all blood cells are developed

"2. That this cell has clearly defined staining reactions by which it can be distinguished from other cells.

"3. That, contrary to the evidence of Knyvett Gordon, we have failed to find the lymphoidocyte in infective endocarditis or other serious conditions, except disease of the haemopoietic organs in which their occurrence is already well recognized.

"4. That the Turk cell has characteristic haematological features and is found occasionally in normal blood—at most one or two per film.

"5. That its presence in larger numbers is probably pathological and points to the existence of a generalized bacterial infection; and that as regards prognosis its presence has an indirect bearing only"

A "Scheme of Haemopoiesis" tracing the various blood cells from the primordial "Lymphoidocyte" is included in the article.

J. D. T.

HARVEY (W. F.). **Large Scale Production of Vaccine.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 584–592.

In this paper, the author, after referring those interested in the details of production to the work of CUNNINGHAM, BROWN and IYENGAR, published in the *Indian Jl. Med. Res.*, 1917, Vol. 5, No. 1, surveys the problems of large scale preparation of vaccine. This he does under six main headings :—

1. Mode of preparation.—Under this heading, which is further subdivided, he directs attention to some improvements arising out of necessity during the war. Of these the first to be mentioned is the replacement of the special flat-sided culture flask by the ordinary commercial round whiskey bottle, the entire internal surface of which can be covered with nutrient medium after the manner of a roll-culture, giving a unit of glassware as easily handled as the test tube and with an enormous surface for growth. The second is the use of peptone media prepared from raw materials, replacing peptone (a product almost entirely of Germany), which give increased bacterial yield and which are suitable for large scale production. Among raw materials available are ox heart, mutton and casein, together with extract of the pancreas of the pig, sheep or goat. In the preparation

of vaccine for use in Hindu and Mahommedan countries and communities neither ox heart nor pig's trypsin may be used; and in Kasauli casein, which can be cheaply produced and stored in the form of coarse powder, has taken the place of mutton. Attention is also directed to the preparation of an agar powder which presents an already filtered and dried agar. This can be made at any convenient time, can be stored without deterioration, and when required has merely to be weighed out and added to nutrient bouillon to make a solid medium.

The solid medium in use at Kasauli is made by the addition of this powder agar to a tryptic digest of casein. To a 10 per cent. suspension of casein in a slightly alkaline menstruum extract of the pancreas of the sheep or goat is added to 4 per cent., and digestion is allowed to go on for 3½ hours, after which it is stopped and the agar powder is added to 4 per cent. This concentration of agar is necessary to ensure adhesion of the nutrient agar to the inner surface of the culture bottle.

Fluid media have great advantages over solid media in the preparation of large quantities of prophylactic vaccine. Among these are ease of preparation of the medium itself, ease of sterilization, and ease of cleaning of glassware used. The chief disadvantage is due to the peptone. In dealing with organisms which have a natural tendency to sediment and with others where sedimentation is assisted by the inclusion in the medium of a fermentable sugar, the undesired peptone can be got rid of by removing the supernatant bouillon and washing and suspending the sedimented organisms in 0·85 per cent. salt solution.

2. Elimination of Contamination.—The chief difficulty connected with the large scale preparation of vaccine is probably the exclusion of extraneous contamination; and a most important consideration is the primary sterility of the medium on which the vaccine is grown. Pocketing of air in the sterilizer in bottles and other contents will interfere with the sterilizing and must be guarded against. To obtain the necessary pure atmosphere of superheated steam the most satisfactory way is to employ a succession of short period compressions and decompressions to extract all or practically all the contained air in the sterilizer. Next in importance is to see that there is no overcrowding in the sterilizer. The superheated steam used must be proportionately in large volume to the material to be sterilized and must circulate freely through and around that material.

3. Standardization.—Under this heading the author includes tests for purity, sterility and toxicity, as well as the actual determination of strength. Tests for purity and sterility are introduced at all stages in the procedure and for all reagents and media used. Purity test is applied to the contents of the unit receptacle—in this case the bottle—before admixture in bulk. The sterility of the prepared vaccine in bulk is tested in the usual way aerobically in solid and fluid media, anaerobically in a fluid medium. A further sterility test is applied after the vaccine has been filled into capsules—the first and last filled capsules from the flask of vaccine being used for this purpose. As a further safeguard a sample of every capsule of vaccine that is filled is kept. This is possible owing to the type of capsule used. The primary sealing is to close the orifice of the capillary stem; the final results in the cutting off of the capillary stem, but before this is done the capsule is shaken and a portion of its contents cut off in the capillary stem, which is then numbered and kept stored in a slot of corrugated paper.

The standardization of strength is carried out by the turbidity method of Major H. C. BROWN, I.M.S. (*Indian Journal of Medical Research*, 1919, July, Vol. 7, No. 1).

The final standardizing test is the tocixity test of the finished product. The procedure is to inoculate 1 cc. of concentrated vaccine before dilution to usable strength, subcutaneously into a guinea-pig. At the same time, therefore, it answers the purpose of an animal test for the dreaded spore-bearing anaerobes which conceivably might have escaped the anaerobic sterility culture test.

The problems referred to under the next three headings, viz., 4, Provision for Emergency, 5, Economy of Labour and Expenditure, and 6, Output, do not call for special notice here, more particularly as some of the most important are incidentally associated with subjects already dealt with.

J. D. T.

VON GUTFELD (Fritz). **Ueber die Herstellung, Prüfung und Verwendbarkeit haltbarer Typhus und Choleraimpfstoffe (Trockenimpfstoffe).** [Preparation, Examination and Employment of Stable Dried Typhoid and Cholera Vaccines.]—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Aug. 8. Vol. 88. No. 6. pp. 455–459. [7 refs.]

The author confirms CHIBA's work on the use of dry heat in the preparation of vaccines [see this *Bulletin*, Vol. 19, p. 779].

The vaccines referred to in the present paper were prepared by killing the bacteria in a bath at 56° C. (the typhoid bacilli by exposure for 1½ hours, the cholera vibrios for 1 hour), and then drying them thoroughly in a " Faust Heimschen Apparat " at 37° C.

The injection of these vaccines had no unpleasant secondary effects on the persons inoculated.

Accounts of animal experiments which were carried out with (*a*) freshly prepared vaccines, and (*b*) vaccines that had been kept at room temperature for 2½ hours are given.

Summarizing the special properties and extent of usefulness of dry vaccines prepared in this way, the author concludes that (1) they can be easily prepared in bulk and remain free from contamination; (2) multivalent vaccines can be readily prepared; (3) they retain their antigenic properties apparently indefinitely without alteration; (4) they take up little room and are easily transported.

For use a given weight of the dried vaccine is rubbed up and well mixed in the required quantity of 0·5 per cent. carbolized normal saline.

J. D. T.

HARVEY (W. F.) & IYENGAR (K. R. K.). **The Advantages of Single and Fractional Dosage in Prophylactic Inoculation.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 424–429. [1 ref.]

Experiments with fowl cholera and pigeons in line with similar experiments in previous investigations by the same authors (see this *Bulletin*, Vol. 19, pp. 779–780) are here described and tabulated. A total of 1·5 cc. of prophylactic antigen for each pigeon was given to three groups of pigeons, to group (1) in a single dose, to group (2) in two doses, 0·5 cc. followed by 1 cc. after an interval of 7 days; to group (3) in three doses of 0·5 cc., each at intervals of 7 days;

and the immunity conferred was tested by an infecting dose of virulent culture given 12 days (and to some of group (1) 19 days) after the last prophylactic inoculation.

In discussing these experiments the authors say that there is a distinct advantage in dividing up the dose of prophylactic antigen for the production of rapid immunization and that the results of a single large dose suggest a depression of the immunizing mechanism (the production of a " negative phase ") by the large dose.

The conclusions they arrive at are :—

> " 1. Two spaced doses of intravenous prophylactic antigen in pigeons afford better protection than a single dose and three doses better than two.
>
> " 2. The production of agglutinins, like the protection afforded, was greater with divided inoculation than with single inoculation of the same total quantity."

J. D. T.

HARVEY (W. F.) & IYENGAR (K. R. K.). **Increase of Dose as a Method of making Use of Old Vaccine.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 739-741. [1 ref.]

In a former communication on the influence of age and of temperature upon the protective power of vaccine, the authors showed that marked deterioration of the vaccine set in after the ninth month of preservation.

They now describe experiments which they carried out to determine if, by increasing the dose, a vaccine which had lost its potency either through the effect of age or of temperature could be used effectively. A table is given " showing the results obtained by prophylactic use, with 2-fold and 3-fold increase of dose, of vaccines which had been kept for 16 months at room temperature and at 37° C., respectively," and the conclusion arrived at is :—

> " Under the conditions of the trials made, no evidence is forthcoming that increase of dose will make up for loss, by age or exposure to high temperature, of the potency of a vaccine."

J. D. T.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1920.** [HODGSON (E. C.), Officiating Director.]—9 pp. ; **and for the Year 1921.** [LISTON (Wm. Glen), Director.]—8 pp. Bombay : Govt. Central Press. [Prices 3 annas & 2½ annas.]

" Simple, rapid and reliable techniques " for the routine Indol and Voges-Proskauer biochemical reactions of lactose-fermenting organisms of the " Typhoid-colon " group are described in the Reports of the Bombay Bacteriological Laboratory for the years 1920 and 1921.

1. The " Cotton-Wool Plug " test for Indol.—This " test is perform d in the cotton-wool plug of the culture tube." " In brief " it " consists in mo stening the under surface of the cotton-wool plug with a few drops of Bohme's solutions, and heating the culture tube for a few minutes. In the case of a positive result, a rose colour appears on the under surface of the plug. This test may be performed with agar as well as with broth cultures."

2. The procedure described for the Voges-Proskauer reaction is as follows :—

> " The culture is inoculated in nutrient broth containing 1 per cent. of glucose ; at the end of every 24 hours' period of incubation a loopful

of the culture is removed on a white porcelain slab and mixed with a loopful of a 40 per cent. solution of caustic soda. In the case of a positive Voges-Proskauer reaction a distinct pink colour develops in about five minutes, and if no pink appears in ten minutes the result is taken as negative. In a large majority of positive cultures it was found that 24 hours' incubation suffices, and it was only in a few cases that further incubation was required. In the glucose broth, the pink colour of the V.P. reaction attained its maximum in about 10–15 minutes and faded away almost completely in about one hour. We have shown that if milk be used instead of broth for the glucose medium, not only a brighter pink colouration was obtained, but the mixture of the culture and soda solution solidified on the slab and formed a dry pink spot which retained the intensity of the colour for more than six hours. In certain instances we have observed that when saccharose was used in place of glucose in the culture media, a positive V.P. reaction appeared after a shorter period of incubation, and the pink colour was brighter than in glucose media. A paper on the subject was read at the Medical Section of the 1921 Session of the Indian Science Congress, held at Madras."

J. D. T.

JOURNAL OF LABORATORY AND CLINICAL MEDICINE. 1922. Sept. Vol. 7. No. 12. (i) **A Convenient, Automatic Apparatus for Experiments with Surviving Organisms.** [HANZLIK (P. J.) and DE EDS (F.)] pp. 751–753. With 2 figs. (ii) **A Convenient Form of Test Tube Rack.** [MORSE (Sterne).] pp. 753. With 1 fig. (iii) **Wassermann Test Tube and Pipette Washer.** [SWANBECK (C. E.).] pp. 754–755. With 3 figs. (iv) **Changes in Nutrient Agar due to Clarifying with Egg.** [THOMPSON (L.).] pp. 758–760. With 5 figs. (v) **A Box for Handling Small Animals in the Laboratory.** [KEYSER (D. L.).] pp. 761–762. With 2 figs.

IBID. Oct. Vol. 8. No. 1 (vi) **Preservation of Complement Serum with 25 per cent. Sodium Chloride.** [LYON (M. W.) & TRAGER (V. B.).] pp. 48–50. (vii) **An Automatic Distributing Apparatus.** [CORNWALL (L. H.) & SCHMITT (G. P.).] pp. 56–58. With 3 figs. (viii) **A Continuous Water Still for a Bacteriological Laboratory.** [COOPER (M. L.).] pp. 58–59. With 1 fig.

IBID. Nov. Vol. 8. No. 2. (ix) **A Simple Method to Determine the Coagulation Time of the Blood.** [GOECKEL (H. J.).] pp. 122–123. With 1 fig. (x) **A New Method for Sterilizing Proteins and other Colloidal Compounds without Denaturization.** [MILLS (C. A.).] pp. 134–136.

i. A convenient automatic apparatus for experiments with surviving organs is here described and figured. Certain advantages are claimed for it, the most important of which are that warming of the organ or tissue is rapidly accomplished, that overheating is practically impossible, and that the organ or tissue is not exposed to the atmosphere during washing or removal of solutions.

ii. A convenient form of test tube rack is illustrated. The tubes are supported in open spiral wire holders so that every part of the tube including the bottom can be thoroughly inspected without its being touched.

iii. A Wassermann test tube and pipette washer is described and illustrated. The advantages claimed for the outfit are that the tubes and pipettes can be thoroughly cleaned, with considerable saving of time and that the washing can be safely left to an orderly.

iv. As a result of experiments described it is suggested that :—

" In making a standard agar the method of clarifying should be specified. An agar which is egg-cleared is a special, or egg, agar, because :—

" 1. It contains sulphur compounds derived from the egg.

" 2. The reaction of the agar is influenced.

" 3. A fermentable substance is added, presumably glucose from egg white, which in both anaerobic cultures and on aerobic plates affects the rate of growth of certain bacteria."

v. A box for handling small animals in the laboratory is described and figured.

vi. In laboratories where comparatively few Wassermann tests are done it is probably better to use a preserved complement serum obtained from several animals rather than fresh complement obtained from a single animal. The authors of this publication have used complement serum preserved with 25 per cent. sodium chloride, that is to point of saturation, for over one year and find that it retains its activity for haemolysis with specific amboceptor for from 3–4 weeks if kept on ice, or for about 10 days if kept at room temperature.

vii. This apparatus is designed for use " in laboratories where a large number of serologic, immunologic or chemical tests are routinely performed. Its function is to distribute rapidly a measured amount of any required liquid ingredient to a large number of test tubes or other containers." Under the trade name " Vol-u-meter " it may be obtained from the Will Corporation, Rochester, New York.

viii. This still " utilizes but one source of water for both condensing and distilling ; maintains a constant water level in the flask of boiling water by automatically feeding the flask with hot water as needed to replace the water evaporated ; runs continuously with little attention ; and has a capacity of one litre of distilled water per hour for each flask connected into the system."

ix. No special equipment is required. The usual precautions are observed in obtaining the blood from the finger tip or from the lobe of the ear. Stock slides with ground cavities used for hanging drop examinations are used. One such slide, with two ground cavities, is inverted, and first the centre of one cavity and then the centre of the other is brought into contact with the blood escaping from the puncture, and a good-sized, long-drawn drop of blood is placed in each cavity.

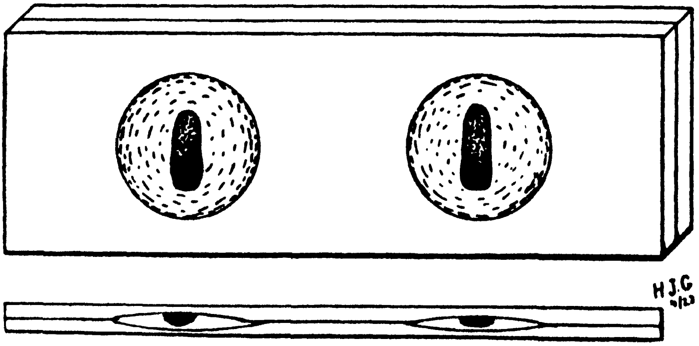


Fig. 1. Method of determining coagulation time of blood [Goeckel].

[Reproduced from the *Journal of Laboratory and Clinical Medicine.*]

The slide is then placed on the top of a second slide lying with the cavities up and paired so that the cavities of the two slides oppose each other and together form small chambers each with a drop of blood suspended on the upper wall of the chamber. When the slides are tilted the non-coagulated blood tends to gather towards the lower border, giving a contrast of a light and dark zone. The accompanying figure shows the slides tilted and also lying flat with the chambers shown in section. The " tilting is repeated about every thirty seconds after the third minute, alternating the incline to cause the blood to flow towards the lighter area." Evaporation is reduced to a minimum and the curved surfaces of the cavity being somewhat magnifying render more visible the distinct clumping of the cells that takes place when coagulation begins. " When coagulation is completed no mobility will be seen, that is all parts of the drop will become fixed or coagulated.

" By this method a coagulation time up to seven minutes appears to be a safe limit."

x. " Summary of results.—Protein solutions may be completely sterilized without alterations in their properties by letting stand the required length of time with the proper concentrating of $HgCl_2$, the precipitate being redissolved and the mercury rendered dialyzable by addition of NaCl. The mercury and salt may then be removed by dialysis, placing copper outside the dialyzing tube to amalgamate with the mercury."

J. D. T.

Poujol (G.). **Notes de technique histologique.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 420–435. With 2 text figs. [4 refs.]

In these notes on histological technique the author directs the attention of the isolated worker to the use of the freezing method for obtaining histological sections. While the paraffin method is specially useful when serial sections are required and while tissues embedded in paraffin may be kept indefinitely and cut at any time, the freezing method is indispensable for rapid diagnosis and has special advantages in conserving fats and fatty acids in sections for later staining by thin elective stains (Sudan red, scarlet red, etc.). Small pieces of tissue fixed in formalin (10–20 per cent. for a few hours will suffice) may be frozen direct from the formalin, cut, stained and examined in a very short time. The freezing method is also the basis of many modern technical methods in the investigation of the nervous system.

In general, all tissues having sufficient cohesion to retain their relations in thin sections are suitable for the freezing method, while very friable, very soft, oedematous, or villous tissues require the paraffin method.

The article finishes with descriptions of special arrangements, attachments or additions to ordinary microtomes to make them suitable for freezing—the simplest, perhaps, being a wooden object-holder to take the place of the ordinary metal one in the Minot or similar microtome.

J. D. T.

i. HARVEY (W. F.). **Bacteriological and Laboratory Technique. Section VII.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 361–423.
ii. ——. **Bacteriological and Laboratory Technique. Section VIII.**—*Ibid.* 1923. Jan. Vol. 10. No. 3. pp. 613–664.

i. The seventh instalment deals with "Tissue Preparation," the particular items being numbered from T_2 to T 2·644, and with "Film Preparation," the particular items under this heading being numbered from F_4 to F 4·624.

ii. The eighth instalment deals with "Bacterial Activities," the particular items being numbered from B_1 to B 3·522. An alphabetically arranged index completes each section.

J. D. T.

MISCELLANEOUS.

THEUNISSEN (W. F.). **A Contribution to the Knowledge of the Indian Psychoses.**—*Trans. 4th Congress Far Eas ern Assoc. Trop. Med. 1921.* Vol. 2. pp. 78–88.

This is a queer medley of aphorisms and oracular utterances upon the psychology, normal and abnormal, of the natives of Netherlands India.

Living in an easy tropical climate the native has no incentive to work. He has no energy. On the other hand, he is less prone to insanity than Europeans. In his insanity the maniacal tendency predominates. A tendency to depression is seldom seen. There is something simple and infantile about his maniacal states. Delusions and hallucinations and suicide are infrequent. The native is highly emotional. But hysteria is uncommon. His delirium is more frequently the result of fever than emotion. In his dementi praecox the element of dementia is hardly apparent. His conversation is " dic and drab " ; women and money are his chief topics. Intellectually the average native is inferior to the European. His mind is different from ours.

In discussing these sententious sayings, Dr. TUONBELAKA and Dr. VAN LOON expressed the good old-fashioned opinion that the native mind is very considerably unfathomable by Europeans.

Dr. CILENTO, in speaking of his experience of natives lower in the social scale than the Javanese, stated it as an " unpleasant fact " that although the European has given them security, sanitation, and good food, he has deprived them of all their interests in life, so that in some islands they have sunk into a state of melancholy lethargy, the prelude to total extinction.

A. Alcock.

VAN LOON (F. H.). **Acute verwardheidstoestanden in Nederlandsch Indië.** [Acute Mental Disorders in the Dutch East Indies.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 5. pp. 658–690.

Among 333 cases of acute mental disorder Van Loon found 176 to be caused by malaria, 76 by syphilis (more in Chinese than in Malays), 10 by pneumonia, 21 by other infections, 29 by dementia praecox, 23 by other predisposing causes (epilepsy, emotions, childbirth, trauma, etc.), and 9 of unknown origin. " Amok," considered by KRAEPELIN to be of epileptic origin, is traced to various different causes. " Amok " is not a clinical entity ; the more aggressive attitude of Asiatics in acute mental disorders in comparison with Europeans is caused by the primary psychical condition of the primitive races, readily susceptible to fright and fear, resulting in aggressive defence against the supposed sources of danger. [See also this *Bulletin*, Vol. 19, p. 356.]

W. J. Bais.

MARIE (A.). **L'aliénation mentale en Egypte au cours des derniers trente ans.**—*Bull. Acad. Méd.* 1922. Oct. 24. Year 86. Vol. 88. No. 34. pp. 154–157.

The curves and statistics of the Egyptian asylums for the last 30 years show :—

1. Insanity in Egypt is subject to the same seasonal influences as elsewhere ; the maximum of entries is in spring, the minimum in winter.
2. The rarity of alcoholism is compensated by the frequency of hashishism.
3. The extreme frequence of pellagrous insanity is the reflection of the maize dietary of the fellah.
4. The progressive increase of mental troubles, as elsewhere, is decided. The country supplies one insane person to 18,000 inhabitants, the towns one to 2,800.
5. The index of general mortality is 22 per cent. higher than in the asylums of Europe, but less than in the general fellah population.
6. No mental disease of Europe is unrepresented in Egypt.
7. General paralysis is not absent as is often asserted. More than 1,000 cases have been seen in Arabs in the 30 years. The incidence is 0·55 per 10,000, as against 12·3 for Greeks in Egypt, and 25·1 for Austrians. The Egyptian cases are syphilitic in the proportion of 100 per cent.

A. G. B.

BLANCHARD (M.) & LEFROU (G.). **Deux cas de rage canine observés à Brazzaville** (A. E. F.).—*Ann. Inst. Pasteur.* 1922. Nov. Vol. 36. No. 11. pp. 812–818. [9 refs.]

The existence of rabies in West Africa is well recognized, and now the disease is reported from Equatorial Africa, where, in and near Brazzaville, two rabid dogs have been observed in life and their rabid condition has been established by appropriate experimentation after death. Three natives were bitten in bare flesh by one of the dogs ; there was delay in getting their wounds dressed, but up to three months afterwards none of them had shown any symptoms of rabies. The other dog bit a native in the hand ; the wound was at once treated with iodine and dressed, and the man subjected to antirabic treatment with virus derived from a Parisian source. Of the dogs it is impossible to say whether their infection was indigenous or of imported origin.

A. A.

HAMERTON (A. E.). **Rabies in Irak, and its Treatment by Carbolized Vaccine.**—*Jl. Roy. Army Med. Corps.* 1922. Dec. Vol. 39. No. 6. pp. 403–418. [6 refs.]

The fact that in the Mesopotamian Force a dog-bite meant a passport to Kasauli tended rather to put a premium on this sort of accident ; but plenty of cases of hydrophobia occurred.

In 1919, 46 persons were bitten by a rabid jackal in camp ; 28 of the men bitten were sent to Kasauli, but they arrived too late, and 5 died of hydrophobia during or shortly after treatment. Of 18 people not sent to Kasauli, 11 died of hydrophobia. The death-rate among the untreated was 61·1 per cent. ; that among the treated was 17·9 per cent.

In 1920–21, 108 Europeans and 379 Indians were sent to Kasauli; 3 Europeans and 3 Indians arrived too late and died of hydrophobia.

In 1921, 10 people among the civil population were bitten by a rabid wolf. Two of them—a Sheik (severely bitten in the hand) and his daughter (dangerously bitten in the face)—attended the Baghdad laboratory for treatment, and four months afterwards they were alive and well. The other 8 refused the laboratory treatment and died of hydrophobia, as also 3 donkeys bitten by the same wolf.

The paper also contains general accounts of the diagnosis of canine rabies, of the manufacture of antirabic vaccine, of the indications for and the limitations of antirabic treatment, of methods of treatment, and other pertinent matters.

A. A.

VAN DEN HOVEN VAN GENDEREN (A. J.). **Some Details about the Antirabic Treatment at the Pasteur Institute at Weltevreden.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 501–508.

At Weltevreden a living virus is used for antirabic treatment. It is obtained by emulsifying the brain of a monkey that has been infected from a rabbit. An aseptic and very finished emulsion is made by shaking up the brain—taken hot from the animal—along with a little saline, in a bottle containing glass beads; it is kept in the ice chest and is not made use of after it is 10 days old. As, for various reasons, native patients are usually more dangerously wounded than Europeans, they receive much more intensive treatment. Cases where symptoms appear 30 days or more after the beginning of treatment are recorded as failures; and of 1,646 Europeans and 3,291 natives treated between 1913 and 1920, 3 of the former and 69 of the latter have died of the disease. Among these 72 fatal cases, 6 (1 European and 5 natives) showed symptoms 30 days or more after the beginning of treatment. Since 1921 in routine treatment "for the first 10 days we inject, besides the usual daily small dose of living virus, every other day a much larger dose of dead virus" (killed by carbolic acid).

A. A.

DA SILVA (E. Pereira) & FIGUEIRA (Luis). **Le traitement antirabique à l'Institut de Bactériologie Camara Pestana en 1915, 1916, 1917, 1918, 1919 et 1920.**—*Arquivos Inst. Bact. Camara Pest.* Lisbon. 1922. Vol. 5. No. 2. pp. 231–243.

This paper merely contains the following statistics:—

	1915.	1916.	1917.	1918.	1919.	1920.
Number of cases treated ..	2,257	2,517	2,424	2,874	3,879	2,758
Deaths before conclusion of treatment	2	2	—	8	4	6
Deaths more than 15 days after	3	3	2	4	5	4
Mortality per cent.	0·13	0·11	0·08	0·13	0·12	0·14

Persons treated are separated in three classes, namely (1) those bitten by animals verified as rabid either by finding of Negri bodies or by inoculation of rabbit; (2) those bitten by animals stated to be rabid after veterinary examination; and (3) those bitten by suspected animals.

A. A.

PHISALIX (M.). **Hérisson et virus rabique.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 779–784.

This interesting communication describes in detail the reaction of the hedgehog (*Erinaceus europaeus*) to rabic virus, in four separate experiments, the charge inoculated in each case being 1 cc. of a 10 per cent. dilution of the fixed virus of the Pasteur Institute of Paris. The hedgehog is known to exhibit a considerable resistance to various venoms as well as to certain bacterial toxins, and these experiments confirm those of FRANÇA (*Revista de Med. Veterin.* 1905. No. 40; and *Arch. Inst. Roy. de Bact. Camera Pestana.* Lisbon. 1907. Vol. 1. fasc. 2. p. 272), which show that to the virus of rabies also it is very decidedly refractory.

In one experiment on a young female hedgehog of 536 gm. the period of incubation was 84 days, and the animal, after some slight and transient paralysis of the hindlegs and some unusual exhibitions of aggressive behaviour, recovered completely without any check to its growth; it is still, after 18 months, alive and well.

In the other three experiments—a young female of 480 gm. and two adult males of 905 and 1,000 gm.—the results, after incubation periods of 15–17 days, were fatal in 26, 142, and 65 days, respectively. In these fatal cases the symptoms were paralysis—in one instance initial and terminal, in one instance restricted to the urino-genital tract, and in one instance progressive and including the genito-urinary tract; tetanic spasms—in one instance general and persistent, and in one instance restricted to the pharynx (in one case not occurring at all); and emaciation—in one instance moderate, in one instance great, and in one instance very great and with supervention of cachexia. In none of these cases was there any aggressive behaviour or aversion to water, and only in the cachectic case was food refused. Only in the case that ended fatally in 26 days were the symptoms steadily progressive; in the other two cases the disease developed with remissions.

FRANÇA, who experimented on hedgehogs with street virus, was able to transmit rabies to rabbits and to other hedgehogs by inoculation with the medulla of hedgehogs dead of the disease; but in these experiments with fixed virus the medulla of the dead hedgehogs was found to be non-infective for rabbits.

(It is incidentally mentioned that in FRANÇA's experiments with street virus 8 out of 20 hedgehogs infected recovered spontaneously.)

A. A.

GOUZIEN (P.), and others. **L'épidémie d'influenza de 1918–1919 dans les colonies françaises.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. July–Aug.–Sept.; Oct.–Nov.–Dec. Vol. 19. Nos. 3 & 4; and 1922. Jan.–Feb.–Mar.–Apr. Vol. 20. No. 1. pp. 264–303; 443–478 and 43–73.

This long paper is a résumé of reports of the great influenza epidemic furnished from the French Colonies. It is calculated that there were not less than half a million victims.

Senegal (THOULON).—Introduced into Dakar by a Brazilian squadron, in 15 days the epidemic disorganized all activities and in 6 weeks had run its course. A Senegalese battalion on the Dakar peninsular was severely attacked and had 690 deaths. In the Brazilian squadron there were 360 cases in 1,380 men. In Dakar itself the death-rate was 6·2 per cent. In Senegal 60 per cent. of the population were attacked, with a mortality of 6·25 per cent. Of 65,000 cases 51,000 were pulmonary. The disease was very severe among natives repatriated from France for tuberculosis.

Mauritania (COMBE).—This country was reached in October. The epidemic spread along the caravan routes and reached the most distant district, Adrar, about 45 days from St. Louis, in March 1919. Communication is scanty. The Moors deal with epidemics by breaking up their encampments into a large number of small groups.

Upper Senegal and Niger (DELRIEU).—Here the cases were estimated at 170,500 with 68,444 deaths, including 25 Europeans. The symptoms are described as chiefly cardio-pulmonary.

Dahomey (BOUFFARD).—Porto Novo was probably infected by canoes from Lagos, with which it is connected by lagoon. The disease was notified from Lagos on September 27 and appeared in Porto Novo on October 7. The most distant district was reached in December. In all 16,000 natives lost their lives.

Cameroon (G. MARTIN).—Duala in the south was invaded in October, Mora and Maroua in the north from Nigeria in December. In the interior the epidemic spread very rapidly owing to the relative density of the population and the wide-spread use of the horse for locomotion. In this Colony, of 399 Europeans 220, or 55·1 per cent., were attacked and 21, or 5·2 per cent., died. Most of the deaths were in old malarial subjects. Of three million inhabitants, a quarter of a million were attacked, with a mortality of about eight per cent. The aged were almost spared. There were numerous recurrences both in natives and Europeans. Quinine is believed to have had a preventive or moderating action.

French Equatorial Africa (HUOT).—The disease reached Brazzaville in November 1918, not by sea as was expected and actually anticipated, but over-land from the Cape by a steamer coming from Upper Belgian Congo to Kinshassa. Two days later infection had crossed to the French sides and rapidly spread over the Colony.

Middle Congo (MARZIN).—The districts most severely attacked were those bordering the Congo and tributary rivers and those traversed by much used roads. Its progress was checked in the sparely populated districts by the natives leaving their villages unoccupied. No statistics could be collected. The pulmonary form was again much the most frequent.

Oubangui-Chari (RICAU).—Introduced into Bangui in November the epidemic rapidly spread and three weeks later had reached Fort Crampel, 700 kilos away. The Upper M'Bomou was not infected till April 1919, by caravans from the Anglo-Egyptian Sudan. The cases for the Colony are estimated at 150,000; the deaths at 27,000. It is noted that the district of M'Poko, where there was famine, had only 24 deaths, that in Ouham-Fafa, where sleeping sickness raged, the mortality was only 8·5 per cent., and that similarly in Upper M'Bomou there were no deaths, but it is said that the villages in these regions are small and far asunder and intercourse somewhat rare. At Bangui the severest attacks were sustained by aged persons and those exhausted by long stays in the Colony. Such recurrences as were noted were mild.

While mild cases did not appear very contagious, it was otherwise with the pneumonic form, which the attendants of the patient never escaped. The author believes that frequent hand-washing was a bar to infection. One village is thought to have been contaminated by eating the corpse of a paddler dead of influenza. Quinine given intravenously is thought to have had favourable action.

Military Territory of Chad (GROSFILLEZ).—The infection followed the caravan routes and its propagation became slow and its course milder as the density of the population diminished.

Gabon (DAVID).—Infection seems to have been introduced either by the doctor who boarded an infected ship and went down with the disease a few hours later, or by the natives who worked in the lighters alongside, and was at once carried up the Ogooue by the local steamer. Later it reached the Colony overland from Cameroon.

Madagascar (CAMAIL).—The escape of Madagascar till April 1919, is attributed to the scarcity of communication with South Africa during the war; one steamer only was running. A steamer from France infected two ports, whence the epidemic spread rapidly. Fort Dauphin at the extreme south, however, was not infected till July, and the port of Tulear on the south-east coast not till August, both overland. Three isolated islands of the Comoro group escaped altogether. The approximate mortality was:—for Europeans 303 or 13·5 per mille, and for natives 86,000 or 26·5 per mille. All ages and all classes were attacked. The mortality was greater in country districts because whole families perished for want of care and even nourishment. Treatment by quinine and fixation abscess are said to have been useful.

Réunion (AUBER).—Infection was introduced by the steamer that contaminated Madagascar, which was repatriating a ship-load of natives of the sland from Marseilles. In the town of St. Denis, 28,000 inhabitants, the epidemic was very severe, causing 1,900 deaths or a mortality of 6·7 per cent. in 70 days.

French Somali Coast (COZANET).—The epidemic probably reached Jibouti by ship from Europe or India in September 1918. Aden was infected at almost the same time.

Union of Indo-China.—The pandemic first made its appearance in July 1918 in Tonkin and Cochinchina and spread very rapidly but with a low mortality. In October grave forms appeared in Cochinchina, and afterwards elsewhere in the Union. The spread was erratic, some provinces being missed and not attacked till later. The disease did not die out till April 1919. The known cases numbered 23,900, the deaths 13,300. Details follow for the five constituent Colonies. The second severe wave reached Cochinchina by ship from India, and it is suggested that the Hindu is specially susceptible to the virus because it was noted that Hindus suffered from an intenser form than Annamites.

Martinique and Guadeloupe.—Influenza reached Martinique in July 1908, with a steamer from France. In the garrison of 3,000 it was moderately severe, causing 12·6 per mille of deaths; in the civil population it was quite mild. The deaths for 1918 exceeded those of 1917 by 12 only.

Guiana (LEGER).—Introduced by steamer from Martinique in November. Here too it was mild, and there seem to have been no deaths.

French Establishments in Oceania (ALLARD).—On November 16, 1918, a steamer reached Tahiti (Society Islands) from San Francisco, where influenza was raging. At the usual examination three persons who were found to be ill were isolated. The next day one succumbed and several of the crew became ill, and shortly the examining doctor, his wife, the pilot and 6 local sailors who helped to moor the ship were stricken. In a fortnight neighbouring islands were affected. The respiratory form with pneumonia and oedema of the lung was most frequent and most fatal. All races were equally attacked, but whereas 51·9 per cent. of natives died, of Asiatics and Europeans only 6·25 and 0·25. Robust adults were chiefly attacked, old men and children little. Forty Tahitian soldiers repatriated from the army of the East, and all more or less malaria infected, were spared, and the author debates whether this should be attributed to the quinine they were taking or the vaccinations for typhoid and cholera to which they had submitted. He says that it was certainly no coincidence. Of 15,300 inhabitants there died 2,498 or 16·3 per cent. and this is not the whole story. At the height of the epidemic at Papeete for want of men to dig graves the bodies were sprinkled with tar and burnt.

New Caledonia (DHOSTE).—By good luck and good management this island remained free till July 1921, though communication with infected localities was maintained. The mode of infection was not determined but it spread with great rapidity and subsided as quickly. There were not more than 30 deaths.

A. G. B.

LISTER (Spencer). **A Filter-Passing Micro-Organism associated with Epidemic Influenza.**—*S. African Med. Rec.* 1922. Nov. Vol. 20. 7 pp.

The material investigated consisted of the nasopharyngeal washings —obtained in 11 instances within 24 hours of the onset of the disease—from 6 carefully selected cases of influenza at Johannesburg and 9 at Hartebeestpoort. The wash (in warm sterile normal saline) was thoroughly emulsified by shaking in a bottle with glass beads, and passed through filter-candles (Pasteur Chamberlan B, Berkefeld V, and Berkefeld N) under a pressure of 25 lb. The filtrates were cultivated in Smith-Noguchi medium under sterilized vaseline, strict anaerobism being essential. Rigid asepsis was observed in every detail of the preparation of the medium. Special 20 cm. long culture tubes of 1·5 cm. diameter were used. In planting culture tubes about 2 cc. of the filtrate was lodged round the fragment of kidney at the bottom of the tube by means of a teat-and-pipette having the nozzle produced as a long capillary tube. The inoculated tubes (along with controls) were kept in an incubator at 37° C., and samples—withdrawn by capillary pipettes—examined from time to time. After a term of 6–8 days minute bodies, sometimes in enormous numbers, were observed in tubes planted with filtrates from 5 out of the 15 cases.

The bodies are of uniform size, stain deeply with Löffler's alkaline methylene blue, and give a peculiar impression of "hardness"; in a magnification of 1,000 they resemble pin points, and are easily overlooked; they usually occur singly, but may form chains of 3–5. They correspond with the filtrable organisms from influenza patients described by OLITSKY and GATES, and are similar to those from a similar source by GORDON.

Preliminary attempts to infect volunteers by spraying nose and throat with the filtrable organism have been made by the author. Of 6 who received the unaltered culture, 1 had a typical attack of uncomplicated influenza beginning 19 hours afterwards, and 2 had a rise of temperature ; and 4 out of 7 who received filtrate of culture, and 2 out of 6 who received heated culture, had a transient rise of temperature.

A. A.

v. DIJKE (M. J.), BAKKER (C.) & HOESEN (H. W.). **On the Etiology of Rhinopharyngitis Mutilans.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 129–137. With 16 figs.

Noting that gangosa has become a collective name for all destructive processes of the nasal cavity and face in natives, the authors quote the description of rhinopharyngitis mutilans given by LEYS (1906) :—A sore throat, followed by destructive ulceration of the posterior wall of pharynx, posterior pillars of fauces and edge of soft palate. Later the soft palate, hard palate, and nasal septum are destroyed in turn and the nose and mouth form one cavity. In 10 per cent. of cases the cartilage and skin of the nose are destroyed also. HOWARD found that the ulcerative process may start also at the nose, and BREINL (New Guinea) that it usually begins on the upper lip. BREINL in 7 out of 8 cases found yeast-like parasites, which he named *Cryptococcus mutilans* [this *Bulletin*, Vol. 6, p. 141] ; the authors sought for these without success. Both BREINL and HALLENBERGER [*loc. cit.*, Vol. 18, p. 257] give illustrations of scars on arms and legs found in cases of rhinopharyngitis mutilans.

The three first cases studied by the authors had a strongly positive Wassermann and reacted quickly to neosalvarsan ; one had suffered from yaws as a child. The authors therefore carefully examined all patients with commencing ulceration in the nose, or showing scars there, for the early stages of rhinopharyngitis mutilans ; enquired of patients with scars on the arms and legs, or elsewhere, whether they had suffered from yaws in youth ; looked for the disease in an area where yaws was endemic ; and examined the nose and throat of all yaws patients.

Eleven cases were collected with destruction of the nasal bone ; in 9 there was a history of yaws ; where the process was active prompt recovery followed administration of neosalvarsan ; in 8 the Wassermann was positive ; 10 showed scars in other regions "intersected by raised streaks," as if caused by burns ; in 4 cases there was periostitis of the tibiae. Many patients were seen with streaky scars, all of whom had suffered from yaws.

In about 130 yaws patients in West Java there were found 3 cases of pronounced rhinopharyngitis mutilans, 8 with ulcerations inside and outside the nose, and 11 cases of yaws nodules in these situations.

It is concluded that rhinopharyngitis mutilans is a tertiary manifestation of yaws.

A. G. B.

KERR (W. M.). **Should Gangosa be removed from the Nomenclature of Tropical Medicine?**—*Amer. Jl. Trop. Med.* 1922. July. Vol. 2. No. 4. pp. 353–358. [8 refs.]

The author discusses the relations of gangosa to syphilis and yaws in the Ladrones Islands and elsewhere, passing in review nine papers on the subject. "As far as our present knowledge permits," he writes, "it is fair to assume that tropical ulcerations of unknown etiology, giving a positive Wassermann reaction and responding readily to salvarsan or its newer derivatives have as an etiological factor either *Treponema pallidum* or *Treponema pertenue*, which are very closely allied organisms." Treponemata have been found in gangosa (ROSSITER, SCHMITTER). The advent of salvarsan "sounded the death knell of gangosa," and the next generation will learn of it only from text books. The author thinks we should cease to employ the term gangosa and place the ulceration thus described in the category of late syphilis or late yaws.

A. G. B.

JENNISSEN (J. A. M. J.). **Splenectomy and Splenic Anaemia.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 283–294. With 1 plate & 1 fig.

In Billiton (off the south-east coast of Sumatra) the usual cause of splenic anaemia is malaria, and the author has resorted to splenectomy only in cases where all other lines of treatment have failed to reduce the spleen. He has performed this operation in 16 cases; the age of the patients was between 30 and 35 years, and the average weight of the spleens removed was 1,040 gm. Two of the patients died 10 and 11 days after the operation; five were alive and in good condition a year and a half afterwards; the rest recovered, and as they returned to China on expiration of their contract, were lost to further observation. In the 14 cases that recovered, the average haemoglobin percentage about four months after the operation had risen from 58 to 78, the average number of red cells from 3,760,000 to 4,630,000, the average colour index from 0·73 to 0·84, and the average number of leucocytes from 4,635 to 8,280. The technique of W. J. MAYS, which the author followed in his operations, is described.

A. A.

LEITAO (Antonio do Nascimento). **Tellurologie et Climatologie Médicale de Macao.**—*Trans. 4th Congress of the Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 383–405. With 1 map and 7 text figs.

The climate of Macao (Lat. 22° 11′ N., Long. 113° 33′ E.) is stated to be particularly salubrious throughout the year. The mean annual temperature (of 10 years) is 71·9° F., the mean summer temperature 82·7° F., and the mean winter temperature 59·1° F. The mean annual rainfall is about 68·9 inches, the average number of rainy days being 148·9. Calm days are rare. Anopheles is not common. *Stegomyia fasciata* and *Mus decumanus* are common, but *Mus musculus* and *Mus rattus* (a variety with a remarkably short tail) are rare. The local rat flea is *X. cheopis*. Plague seldom troubles Macao, and then only in the bubonic form.

A. A.

EMBREY (Hartley). **The Investigation of Some Chinese Foods.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 196–210. With 35 charts.

With a view to using local foods intelligently in the new Peking Hospital the authorities at the Medical College are investigating their composition and fuel value. The particulars of 36 of the more common articles of food are here tabulated, and the results of a series of dietary experiments with white mice are described and graphically recorded. As an item of general interest the author calls attention to the fact that in sprouting beans, apart from the increase in water-soluble C vitamin, there is also decided increase in water-soluble B as well as in the calcium content.

A. A.

KUBO (N.). **Untersuchungen ueber die Hautfarbentöne in Tropenländern (besonders in Formosa).** [The Complexion in the Tropics, especially Formosa.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 257–259.

The muddy discoloration of the skin often seen in natives of the tropics (particularly in Formosa) as well as in sojourners there is here briefly analysed in itself, not in its causation. According to the author the transparency of the skin itself is impaired, the sebaceous and sweat glands are hypertrophied, the squamous epithelial layer is thinned, and the dermal papillae show signs of atrophy.

A. A.

·HATA (S.). **Ueber die Salvarsanintoxikation, insbesondere die Dermatitis und den Ikterus.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 169–179. With 2 charts in text.

The various symptoms of arsenical (salvarsan) intoxication are individually discussed at some length—shivers and fever, irritation of the throat, sometimes with swelling of cervical glands, exanthematous eruption on skin and mucosa of gums and throat, jaundice, albuminuria, symptoms of acute enteritis, or, in chronic cases, constipation. The dermatitis, which is urticarial in acute cases, is more eczematous in chronic cases. The jaundice may be the result of acute atrophy of the liver, but usually is catarrhal.

The author during the last few years has administered 4,592 intravenous injections of the Japanese equivalents of salvarsan and neosalvarsan to 864 patients, and has observed 34 cases of intoxication, 24 acute and 10 chronic, 13 severely and 11 slightly acute, 30 manifested by dermatitis alone, and 4 by dermatitis and jaundice together. His treatment is to relieve the liver and clear the bowels with mag. sulph. and to keep the kidneys flushed ; gargles are useful, and the heart may require attention.

A. A.

REVIEWS AND NOTICES.

Ross (Ronald). **Memoirs: with a Full Account of the Great Malaria Problem and its Solution.**—pp. xi + 547. With 11 plates. 1923. London: John Murray, Albemarle Street, W. [Price 24s. net.]

Of factors leading to a just appreciation of Ross's great work on malaria the following seem salient.

A first recollection, his father apparently dying from fever in a scorching Indian plain; at sixteen, equal first in Drawing for all England in the Oxford and Cambridge locals; his wish to become an artist overruled; a medical course begun at Barts, and resolving itself into writing poetry, enthusiastic piano study, and such medical work as would enable him to enter the Indian Medical Service, and thereafter discard medicine for art with the least possible delay; on reaching India, in 1881, a world-course in poetry begun, Italian, French and German being learnt as necessary preliminaries; mathematics enthusiastically and deeply studied; several shorthand systems devised; the violin learnt; plays, poetry and a novel written; and his first leave taken in 1888, worn out, depressed, and feeling, full to the brim as the years had been, that he had nevertheless neglected his duty as a medical man. A return from leave with the D.P.H. and a box of bacterial cultures, the latter useless since he was at once ordered to Burma on the Chin-Lushai Expedition; the opportunity taken to study mosquitoes, resulting in the distinguishing of *Culex* and *Stegomyia* under the terms "grey" and "brindled"; on demobilization his time divided between learning the Greek and Latin languages and reading their verse, writing poetry himself, and searching for LAVERAN's bodies, then known for ten years. These, owing to faulty technique, he did not find, was naturally sceptical of their existence, and in four papers pointed out that bodies which others in India were identifying as such were normal blood constituents. Such are the antecedents which lead to his great work.

Arrived in England, in March 1894, KANTHACK immediately assured him that LAVERAN's discovery was sound, referring him to MANSON, who showed him crescents. Thus began a pregnant, fruitful intercourse.

Although aware of LAVERAN's suggestion that mosquitoes perhaps carry malaria, Ross was immensely impressed by MANSON's conclusions that the swelling and exflagellation of the crescent, occurring only at an interval after extraction, were inferential, not of death struggles, as certain Italians held, but of a phase of life history occurring in the mosquito; and he left for India, after winning the Parkes Memorial Prize on Malaria, determined to test MANSON's hypothesis (which held further that the parasite returned to man through drinking water), after urging MANSON to test it himself. He started work knowing nothing of the zoological classifications, and little of the anatomy, of mosquitoes. In May the lid between Secunderabad and the Inferno wears uncommonly thin, yet Ross drove indefatigably over it at all hours, from hospital to hospital several miles apart, in search of crescent cases; found that he could get mosquitoes to bite by wetting the air; and proved that crescents flagellate far more readily in the stomach of "grey" and "brindled" mosquitoes than in blood from a finger. The mosquito's stomach was, then, the natural locus for exflagellation, and these facts were the first evidence of the correctness of MANSON's hypothesis. But what became of the flagella, which he held to be the next stage. Could they develop into the gregarines found in the pupa and imago? Two and a half months' work showed that this could scarcely be so, since the gregarine life history so discovered was complete in itself. A flagellum was actually watched attempting for a considerable time to enter leucocytes, but the significance of the act was missed. Official duty then made its first and almost complete break in his malarial work, he being detailed to reduce to reasonable decency the disgusting sanitary state of the Bangalore Municipality, a task into which he threw himself with all his wonted energy, and for which, as the Resident noted, by reason of the zeal, thoroughness and tact displayed, no more capable officer could have been selected. Of this experience Ross wrote,

We cry " God make us Kings,
Poets and Prophets here ! "
The scornful Answer rings
" First be My Scavenger."

He now swallowed, without ill-effects, large numbers of mosquito gregarines, and on May 27, 1896, wrote to MANSON, " The belief is growing on me that the disease is communicated by the bite of the mosquito. What do you think ? " MANSON dissented on the grounds, erroneous as we now know, that the mosquito bites but once. Incidentally Ross showed, by pricking the finger under vaselin, that exflagellation was not a death spasm, since, under these conditions, the crescent died without exflagellation.

On leaving Bangalore his application, backed by MANSON, and by SIBTHORPE and KING, respectively Surgeon General and Sanitary Commissioner of Madras, to be placed on special duty for the investigation of malaria, was refused ; so he sought, and with difficulty obtained, two months' leave to study it himself. Here he saw, at Sigur Ghat, his first *Anopheles*, though he did not know it by that name till after he had proved his case, and discovered that the number and kind of mosquitoes haunting houses is no indication at all of the general mosquito population of any locality. Extension of leave to study malaria was refused and he was ordered summarily to Secunderabad instead of to the malarious spot he would have chosen. Yet, as he wrote,

". . . . where we cannot choose
The crown of life is set."

He determined that his investigation should now take the form of feeding mosquitoes on malarial blood and searching every part of their bodies for any evidence of parasitism. There occurred repeated failures to infect " grey " and " brindled " mosquitoes with human malaria. Almost on one and the same day he found in his hospital the second *Anopheles* he had ever seen, that is he recognized it as akin to the dapple winged Sigur Ghat insect, and one of his three collectors, paid of course by himself, brought in material from which there also emerged mosquitoes of the same type, probably *A. stephensi*. They were duly fed, and four days later, on August 20, 1895, tired, in great discomfort from the dreadful weather, discouraged because none of the new mosquitoes had so far shown anything which he had not already seen in thousands of "grey" and "brindled" forms already dissected, having examined all the body tissues of yet another and found nothing, he, reluctantly, and as a matter of duty, went over the separated stomach. There before him lay cells, 12μ in diameter, too circular, too sharply outlined and too small to be the familiar stomach cells, and above all pigmented, and with that quality of pigment which the crescents have. Next day, in the last mosquito of that batch, there were the same cells, but larger. Having verified this infection and this growth in three other mosquitoes, controls throughout being free from infection, he reported on September 15 to the Director General—through the usual official channels—" The cells are, in my opinion, probably the long-sought alternative form of the parasite of malaria in the mosquito " and on September 27th he was stunned by receipt—through the usual official channels—of an order to proceed to Bombay. This second complete break in his investigations resolved itself into banishment to a non-malarious locality, terminated four months later, after the active intervention of MANSON and FAYRER, by transfer to Calcutta on special duty for the investigation of malaria and kala azar, with headquarters in Calcutta.

MANSON wrote to him at this time regarding MACCALLUM's observations : " If the polymitus is a fertilising factor in the halteridium cycle the flagellated body of malaria is also a fertilising factor in the plasmodium cycle. And if this is the case, and the fertilised crescent-derived sphere becomes transmuted into a travelling-cell-piercing vermicule in the stomach of the mosquito we have the explanation of the pigment in your mosquito stomach cells." Since Ross could get no suitable crescent carrier in Calcutta he switched temporarily to the related Proteosoma, satisfied that the same life cycle must hold for both. First was entailed the easy controversion of GRASSI's statement that mosquitoes do not bite birds. Then followed the demonstration that just as in *Plasmodium* do oocysts appear and grow in the stomach of *Anopheles*, so do the oocysts of *Proteosoma* develop and grow in *Culex*, reaching in six days, at the temperature at which Ross worked, their maximum size; and thereafter bursting. Since he had to report on malaria and kala azar in six months, since he could get no suitable malarial cases in Calcutta, and since both malaria and kala azar were to be found in the Darjeeling Terai, Ross, after official permission obtained, moved thither. Neither at Punkabari nor Naxalbari, places which, as a four years' personal experience convinces one, he would, a few weeks later, have found saturated with malaria, could he find suitable malaria cases in man, nor *Proteosoma* infection in sparrows. Moreover, his activities, giving opportunity to a skilfully engineered plague scare, depopulated two tea gardens, and he, perforce, returned to Calcutta with two of his six precious months wasted. Three weeks later he had infected fresh mosquitoes. Then he showed successively, by using a concentrated in place of a weak saline solution for their dissection, that the oocysts contained sporozoïts; that the bursting of the former threw the latter into the coelom; that the latter were broadcasted in the circulation, collected in the thorax more numerously than in the abdomen, appeared in glands, hitherto unknown to Ross, whose ducts he traced to the proboscis and whose function he rightly deemed to be "salivary." The inference was that infection occurred with feeding The final proof lay in permitting mosquitoes to bite three sparrows proved healthy by several examinations. All became most heavily infected, ten controls remaining without infestation. He wrote to MANSON on 9th July, 1898: "One single experiment with crescents (there are numerous dapple-winged mosquitoes here now) will enable me to bring human malaria into line with Proteosoma. They are sure to be the same. I ought to do it in two months; it has taken me only one to work out the germinal rod cycle." He had won the race against time and accordingly obtained an extension of the period of special duty, but it was not to be devoted to the consummation of the study of malaria which was so thoroughly his due. After a short holiday, forced on him because he had ceased to sleep, he was ordered to Assam to investigate kala azar. Thus occurred the third, the final and irretrievable, interruption to his work, and this consummation fell to Italians. Ross details the evidence which convinces him that they were well acquainted with his work on *Proteosoma*, and writes bitterly of their refusal to acknowledge any indebtedness to him when they demonstrated the life cycle of *Plasmodium*; which attitude of theirs seems to imply that, just as they hold that for *Hymenolepis* the life history varies completely within the genus, so for *Plasmodium* is the life history of the allied *Proteosoma* no guide; and that in reaching it they steered an uncharted ocean. The reader will either give it them both ways or no way, according to his biological knowledge and convictions. For the writer the words, with which the Nobel prize was conferred on Ross in 1902, suffice, "By your discoveries you have revealed the mysteries of malaria."

Such was Ross's great achievement—worked out at his own expense and, except for the final period of special duty, in addition to his official work—attained in the teeth of difficulties, happily, one hopes, incapable of recurrence in India, and which would have smashed a lesser man, or one with less determined supporters.

The mental picture which the perusal of the history of this part of Ross's life leaves on one who has never met him, is that of an inflexible determination driving a versatile and variety-loving ability along its narrow chosen channel.

Clayton Lane.

The Practice of Medicine in the Tropics. Edited by BYAM & ARCHIBALD. Vol. III. Section XI.—Helminthiasis. (pp. 1685–1965.)

In the critique on Section XI of BYAM and ARCHIBALD'S Practice of Medicine in the Tropics (this *Bulletin*, vol. 20, p. 521) there are two misstatements. By the incorrect use of inverted commas Professor STEPHENS has been unintentionally unfair in his comment on the figure of *Metagonimus yokogawai*. The specimen is far from " imaginary," carries indeed with it a painfully vivid recollection of seven laborious days spent in making superimposed drawings of remarkably real serial sections, the necessary preliminary to the fluke's reconstruction ; which is after all only another way of saying that it is a necessary preliminary to determining the actual shape and position of the viscera under conditions in which they are not distorted and displaced, as they inevitably are by the usual crushing process.

Again, the figure of *Diphyllobothrium stemmacephalum* is accompanied, not " merely by a scale " as stated, but by a legend, actually inordinately long because its words were not counted, as were those of the strictly rationed text ; in which legend can be read the reason for illustrating the genotype and not man's parasite.

Of the criticism proper there is no complaint, though this opportunity may be taken to point out that, with figures as strictly rationed as words, it did not seem unreasonable to leave deliberately to other publications, including Professor STEPHENS' own standard textbook, the familiar stereotyped figures which he so "longs to see."

Clayton Lane.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 8.

HELMINTHIASIS.

JOYEUX (Ch.). **L'étude des Helminthiases.**—*Congrès de la Santé Publique et de la Prévoyance Sociale. Marseille. 1922. Sept. 11–17.*—1922. 20 pp.

Professor Joyeux, lamenting the paucity of French names among investigators of Helminthology of late years, has issued this paper as a guide for his confrères in the Colonies in studying and carrying out research in this subject..

The plan of study is divided into two main parts: (1) Medical, including the pathology and treatment of disease due to helminths. (2) Epidemiological, devoted particularly to the question of the evolutionary cycles.

He indicates the lines along which research should be carried out, starting with the morphology in the adult and larval stages, and proceeding to the identification of the larva by experimental infection of hosts, until we arrive again at the point of departure. As a concrete example of the method recommended, Joyeux gives the steps followed by LEIPER in discovering the mode of transmission of *S. haematobium* in Egypt. He treats in some detail of the rearing of experimental animals, pointing out a few of the difficulties met with.

The paper as a whole would constitute an excellent introductory lecture on the subject of research in helminthology, and if the advice given were conscientiously followed there would be a considerable reduction of ill-digested matter which from time to time finds its way into scientific periodicals.

H. Harold Scott.

LEGER (Marcel) & BAURY (A.). **Parasitisme intestinal au Sénégal.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1020–1023. [4 refs.]

During October 1922 faecal examinations of 1,011 patients at the Colonial Hospital and at the Central Hospital, Dakar, were carried out. Of this number 629 were natives and 382 Europeans. The majority of the latter presented diarrhoeic or dysenteric symptoms. The former are divided into two categories according as they showed intestinal symptoms or not. The following table is compiled from information in the text:—

—	No. examined.	No. positive.	Percentage.	*Ent. histolytica.*	Flagellata.	Ankylostomes.	Ascaris.	Trichuris.	Taeniae.
Natives exhibiting no intestinal symptoms	444	291	65·5	—	—	50·5	20·9	10·3	4·2
Natives with dysenteric or diarrhoeic symptoms	185	120	64·8	61	13	6	1	0·5	0·5
Europeans	382	200	52·5	27·7	9	4·2	4·6	7·7	1

R. T. Leiper.

ARLO (J.). **Recherches sur le parasitisme intestinal chez les tirailleurs sénégalais.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 180–183.

The stools of 451 Senegalese soldiers were examined for evidence of intestinal parasites, and 50·1 per cent. were found to be harbouring hookworm, ancylostoma being more than three times as numerous as necator; 4·65 per cent. harboured *Taenia saginata.* Only a few showed other helminth infections. The degrees of parasitism varied widely in different colonies; thus, it was low (18 per cent.) in Senegal, but high (71 per cent.) in Dahomey, where there is more water and the "sanitary conditions are deplorable."

R. T. L.

REZENDE (Motta). **Verminoses na Policia Militar.** [Helminthiasis among the Military Police.]—*Arch. Brasileiros de Med.* 1923. Feb. Vol. 13. No. 2. pp. 171–199.

Of 745 cases in the Federal District of Rio, 580, or 77·8 per cent., were found to harbour helminths. Multiple infection was common, the most frequent being necator, ascaris, and trichuris. There was not a high degree of anaemia; more than half of the cases had over 80 per cent. haemoglobin, and a larger proportion still exceeded 4½ million red corpuscles per cmm.

[The actual percentage infected with necator is not easy to estimate, as the figures are given in different combinations in various tables, but would appear to be in the neighbourhood of 40 per cent. or a little over.]

One patient suffering from necator, trichuris, and schistosome infection, showed symptoms of pernicious anaemia—Hb 22 per cent., red cells 1,280,000.

For nematode infections oil of chenopodium was used, two capsules, each containing 25 drops, being the usual dose, followed an hour later by 40 gm. of magnesium sulphate. The treatment was repeated two or three times. For taenia, the ethereal extract of Felix mas with calomel, and for schistosomes "intravenous injection of emetine hydrochloride and tartar emetic." [In neither is the dosage stated.]

H. Harold Scott.

BEACH (W. H.) & O'BRIEN (H. R.). **A Study of Intestinal Parasites of a Small Group of Siamese Soldiers.**—*Milit. Surgeon.* 1923. May. Vol. 52. No. 5. pp. 510–513.

Of the soldiers examined 103, of ages varying between 18 and 22 years, were found to be harbouring hookworm, and were treated with thymol or oil of chenopodium. The symptoms were slight and indefinite, and the average Hb index was 76. The majority of the parasites were the necator, but in some both this and ancylostoma were passed by the same individual.

R. T. L.

YAMAGUCHI (Seido). **[Results of the Examination of the Students for the Eggs of the Enteric Parasites.]**—*Hokuetsu Igakkwai Zasshi* (*Jl. of Hokuetsu Med. Soc.*). 1922. Oct. Vol. 37. No. 5. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 34.]

YAOITA's antiformin-ether method was applied to stools from 356 students in the Niigata Medical College ; 76·6 per cent. showed parasitical vermin, of which 26·6 per cent. were those of ascaris, 50 per cent. trichocephalus, 16 per cent. ancylostoma, 14 per cent. trichina [is this possibly strongyloides ?], 21·3 per cent. liver distome, 4·7 per cent. *Metagonimus yokogawaii*, 0·6 per cent. *Necator americanus* and 0·3 per cent. *Bothriocephalus latus*.

R. T. L.

KAMADA (Ryonosuke). **[On My New Method of collecting the Parasites' Eggs.]**—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1922. Sept. Vol. 29. No. 5. [Summarized in *Japan Med. World.* Tokyo. 1923. Jan. 15. Vol. 3. No. 1. p. 11.]

Faeces is treated with a 15 per cent. solution of antiformin in a beaker. The supernatant fluid is separated off and similarly treated again. It is then centrifuged for 2–3 minutes, the supernatant stained antiformin layer is poured off, and to the precipitate 10 cc. of saline solution of specific gravity 1050 is added. It is again centrifuged for 2–3 minutes, and the sediment is then examined microscopically.

R. T. L.

MOLINARI (G.). **La nosografia dell' elminthiasi come criterio presuntivo di diagnosi.** [Presumptive Diagnosis of Helminthiasis from Clinical Signs.]—*Riforma Med.* 1923. Feb. 12. Vol. 39. No. 7. pp. 158–159.

The author recounts the signs which frequently accompany the presence of worms—cough, grinding of the teeth, night-terrors, and so forth—and states that such are sufficient for diagnosis, though it is as well to confirm by faecal examination.

R. T. L.

BARLOW (C. H.). **Life Cycle of** *Fasciolopsis buskii* **: Discovery of Means of Infestation of Human Beings.** [Correspondence.]—*China Med. Jl.* 1922. Nov. Vol. 36. No. 6. p. 546.

In a short preliminary note it is stated that the life-cycle of *Fasciolopsis buskii* in man shows differences from that described by NAKAGAWA for the pig in Formosa. These differences occur mainly in the "parthenitae" and cercariae, and suggest that the form in the man and in the pig are of different species. Human infection takes place through eating water chestnut or water red ling on which the cercariae encyst. No cases in pigs have been discovered even in the areas of greatest infestation of man around Shaohing in China.

R. T. L.

SUZUKI (Sotowo). **[Effects of Certain Physical and Chemical Influences upon the Eggs of** *Fasciolopsis buski.*]—*Taiwan Igakkwai Zasshi* (*Jl. Med. Assoc., Formosa*). 1922. Nov. No. 225. In Japanese. pp. 1–26. [English Summary. p. 1.] [Summarized also in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 36.]

The optimum temperature for the development of the eggs of Fasciolopsis appears to be between 25° and 37° C. In Formosa immature eggs do not develop in the winter when the temperature is below 20° C., while mature ones develop and hatch even when the temperature sinks as low as 3–5° C. Immature as well as mature eggs develop and hatch at 37° C. Direct sunlight, if not exceedingly severe, or the absence of it, does not influence the development. Oxygen has also been found not to be a necessary element for the development, because in a vial nearly anaerobic in condition they develop enough to hatch.

R. T. L.

LAGRANGE (E.). **Observations sur les Trématodes d'Indochine.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 173–179. [9 refs.]

The author describes some cercariae found in molluscs of Indo-China. He was unable to identify among the various cercariae examined at Saigon the larvae of *Fasciolopsis buski.* He notes that in 2,400 examinations of human stools recorded in the registers of the Institut Pasteur no case of Fasciolopsis occurred between 1918 and 1921.

R. T. L.

MUTO (Mosatomo). **[On the Duration of Life of** *Clonorchis sinensis* **in the Animal Body.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1922. Aug. No. 2292. [Summarized in *Japan Med. World.* Tokyo. 1922. Dec. 15. Vol. 2. No. 12. pp. 345–346.]

In dogs experimentally infected with *Clonorchis sinensis* the author observed that in one the parasites were alive after 3 years, 6 months and 15 days, and in a second case after 4 years, 1 month and 14 days.

R. T. L.

REYNAUD (G.) & LEGER (M.). **Les Bilharzioses ou Schistosomoses dans les Colonies françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale. Marseille, 1922. Sept. 11–17.*—1922. 24 pp.

The first part of this paper is occupied by an account of the geographical distribution of schistosomiasis in the French colonial possessions. In the second section, treating of endemiological factors, is an interesting note on aberrant localization of the ova. Among these are 11 cases of terminal-spined ova in the faeces as well as urine, an equal number of similar ova in the faeces only, five cases of lateral-spined ova in the urine—in three of them in the stools also, in the remaining two in the urine only. Ova of *S. haematobium* in the faeces, while absent from the urine, occurred in Equatorial Africa only, and the authors regard this as more than a mere coincidence, and wonder whether there may be a special variety of *S. haematobium*, or whether some special gastropod is concerned in the development.

The last part of the paper deals with treatment. The chief place is assigned to intravenous injection of tartar emetic. The initial dose was usually 0·03 gm. every two or three days, increased by a like amount for four doses. The maximum dose rarely exceeded 0·13 gm, though with caution 0·16 gm. could be given. The total varied between 0·75 and 2 gm. Other methods employed were methylene blue, 0·3 gm., in cachets daily, emetine hydrochloride intramuscularly in doses varying between ⅛ and ¾ gr. For bladder symptoms thymol, salol, turpentine, or urotropine was employed.

R. T. L.

LEGER (Marcel). **Les bilharzioses urinaire et intestinale au Sénégal.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 141–144.

Of 171 cases of vesical bilharziasis in French West Africa examined with care four, *i.e.*, 2·35 per cent., showed lateral-spined eggs alone or in association with terminal-spined eggs. In 10 cases, *i.e.*, 27 per cent., out of 36 of intestinal bilharziasis reported from French West Africa the *Schistosomum haematobium* occurred, and in one only of these cases in association with lateral-spined eggs.

Bullinus contortus occurs in West Africa, but its distribution is irregular and its incidence uneven. Among the other molluscs of Senegal which can be invaded by the miracidia of *S. hematobium* are *Bullinus strigosus*, *Pyrgophysa dunkeri*, *Limnaea africana*, *Melania tuberculata*. The carrier of *S. mansoni* in Egypt, viz., *Planorbis boissyi*, does not occur, although more than 16 other species of Planorbis are found in French West Africa, notably *Planorbis bidouxi* and *P. salinarum*.

R. T. L.

ANDERSON (Ch. W.). **Note sur les gîtes à** *Bullinus* **et à** *Planorbis* **de la Tunisie. Leurs rapports avec les foyers de Bilharziose. Carte provisoire de leur répartition.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 954–956. With 1 fig. [1 ref.]

In Tunis the distribution of the genus *Planorbis* seems limited to the Northern Region between the latitudes 37° 21 N. and 36° 23 N. The species met with belong to *P. philippii* var. *subangulatus*. The most important focus appears to be Oued Bezirck on Cape Bon. The author has failed to find it at Gabès where it had been noted by ANDRÉ, and was similarly unsuccessful in obtaining *P. marmoratus, P. spirorbis, P. agraulus,* recorded by GADEAU DE KERVILLE, or *Planorbis corneus* var. *metidjensis.*

The genus *Bullinus* is of widespread distribution in Tunis, and the species *B. contortus, B. brochii,* and *B. dybowski* coincide with the distribution of *S. haematobium.* No cases of *S. mansoni* are known in these regions.

R. T. L.

GOBERT (E.) & ANDERSON (Ch.). **Un nouveau foyer de bilharziose en Tunisie.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 18–21. [2 refs.]

CHAURAND (G.) & DIACONO (H.). **Contribution a l'étude de la répartition géographique de la bilharziose en Tunisie. Note sur six nouveaux cas originaires de Kairouan.**—*Arch. Insts. Pasteur de l'Afrique du Nord.* 1923. Feb. Vol. 3. No. 1. pp. 94–96. [2 refs.]

Bilharziasis is widespread in the oasis of Nefzaoua and at Gafsa, but has not been recorded hitherto from the central region of Tunis. Seven cases of vesical bilharziasis have recently been observed at Kairouan by Drs. Chaurand and Diacono. None of these cases had ever left the town. The authors have found *Bullinus contortus* in plenty in the neighbouring ponds.

R. T. L.

ARCHIBALD (R. G.). **Some Investigations connected with the Spread of Bilharziasis in the Dongola Province of the Sudan.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. pp. 419–426. With 1 plate. [3 refs.]

Bilharziasis is most prevalent in the province of Dongola in the villages bordering upon the pump-irrigated areas, notably Nuri, Kareima, Goria ; cases have also occurred at Tangassi and Argo Island. Intestinal bilharziasis due to *S. mansoni* does not exist among the native population. Large numbers of *Isidora* [*Bullinus*] *innesi* were present in the irrigation canals. These were experimentally infected in the laboratory at Khartoum, and the resulting cercariae were found to have on the average slightly smaller measurements than those given by BAHR and FAIRLEY and FAUST for *S. haematobium.* Negative results followed attempts to infect experimentally *Cleopatra bulimoides, Corbicula consobrina, Lanistes carinatus* and *Melania tuberculata.* Measures for the eradication of the disease consist of (*a*) action of anthelmintic drugs administered to the infected persons, (*b*) destruction of the molluscan intermediaries. His experience in Dongola leads the author to affirm that method (*a*) can be considered only an incomplete one for eradicating the infection on account of the number of infected women and children who will not submit to treatment, the difficulty of controlling the antimony therapy, and the existence of latent cases of infection. Although at first sight difficult, the proposal first made by LEIPER to eradicate the molluscs by intermitting the flow in irrigation areas during the summer months is a practical proposition in Dongola. The use of well water for ablution and drinking is also a valuable prophylactic measure.

R. T. L.

CAWSTON (F. G.). **The Experimental Infection of Some Animals with Cercariae from Fresh-Water Snails.**—*S. African Med. Rec.* 1923. Mar. 10. Vol. 21. No. 5. pp. 112–113.

Guinea-pigs fed upon lettuce on which *Cercaria pigmentosa* from *Limnaea natalensis* had been allowed to exist were found after 62 days to harbour immature flukes resembling *Fasciola gigantica* in the liver, thus confirming previous work by A. PORTER. Guinea-pigs were also infected by the mouth by feeding with lettuce containing numerous schistosome cercariae from *Physopsis africana*. *S. haematobium* and *S. bovis* were thus obtained experimentally.

R. T. L.

CAWSTON (F. G.). **The Experimental Infestation of** *Physopsis africana*. —*Ann. Trop. Med. & Parasit.* 1922. July 20. Vol. 16. No. 2. pp. 207–211. With 3 text figs. [2 refs.]

For experimental work *Physopsis africana* was readily reared in wooden tubs kept out of doors in a shady place and without change of water. Although the author has found apparently mature cercariae in Physopsis exposed to infection only a fortnight previously, cercariae are never discharged by the snail until the lapse of about 35 days.

R. T. L.

GREVAL (S. D. S.). **Schistosomiasis Bilharziasis in Arabia. A Preliminary Report.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 943–947. With 1 map in text.

During a period of seven months two cases of *S. haematobium* and two of *S. mansoni* have been found in the laboratory at Aden. Two of these, one from each group, had never left the mainland of Arabia, while the other two had visited Kamran and Perim, just off the coast, which, like Aden, are supplied with condensed water. This is said to be the first record of the occurrence of *S. mansoni* in Asia.

R. T. L.

BETTENCOURT (A.) & FIGUEIRA (L.). **Un nouveau foyer de bilharziose vésicale dans l'Algarve (Alportel).**—*C.R. Soc. Biol.* 1923. Feb. 3. Vol. 88. No. 4. pp. 319–320.

Following upon the discovery by Dr. SILVA, of Olhao, of a case of vesical bilharziasis in Algarve in a patient who had not had any opportunity of contracting the infection in the known endemic centre of Atalaia at Tavira, the authors have searched for another endemic focus and have found the eggs of *S. haematobium* in the urine of 9 out of 12 suspected cases in the village of Alportel, 28 kilometres from Tavira. They suspect that these infestations were acquired from one of the small pools named " Pego do inferno " on a stream rising at Alportel. In these waters occur *Planorbis dufourii*, which has already been shown to be the carrier of *S. haematobium* at Tavira. Local opinion maintains that the appearance of bilharziasis in this region is relatively recent.

R. T. L.

FRANÇA (Carlos). **L'hôte intermédiaire du** *Schistosomum haematobium* **au Portugal.** (*Planorbis dufourii* Graells.)—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 805–809. [11 refs.]

Typical *Planorbis corneus* does not occur in Portugal, and the species *P. metidjensis*, implicated as a carrier of *S. haematobium* in southern

Iberia, has been held by PALLARY to be a synonym of *P. dufourii.* The author has compared these two forms in detail, and is of the opinion that they are certainly distinct, although closely allied. The number of coils of the shell differs. The aperture is oval and the shell smooth in *P. metidjensis*; the aperture is circular and the shell rough in *P. dufourii.*

R. T. L.

WILLIAMSON (George A.). **A Planorbis as the Intermediate Host of** *Schistosoma haematobium.* [Correspondence.]—*Brit. Med. Jl.* 1923. Feb. 24. pp. 351–352.

The implication of a species of Planorbis as a carrier of *S. haematobium* in Portugal greatly enlarges the possibility of the spread of vesical bilharziasis in other countries, and of the appearance of this infestation in Australia through the infection of a suitable gastropod by Australian soldiers infected in Egypt.

R. T. L.

MILTON (J.). **Schistosomiasis in Australia.** [Correspondence.]—*Med. Jl. Australia.* 1923. Feb. 10. 10th Year. Vol. 1. No. 6. pp. 166–167.

As recent work has demonstrated that the two common African schistosomes can and do under certain conditions adapt themselves each to the generic host of the other the possibility of these parasites adapting themselves to new countries is enormously increased, and Australia, with its many species of Bullinus, Isidora and Isidorella, lies open to invasion [although recent curative prophylaxis minimizes the seriousness of the outlook].

R. T. L.

DEW (Harold R.). **Observations on the Pathology of Schistosomiasis** (*S. haematobium* **and** *S. mansoni*) **in the Human Subject.**—*Jl. Path & Bact.* 1923. Jan. Vol. 26. No. 1. pp. 27-39. With 2 plates. [12 refs.]

This account of the pathology of schistosomiasis is based on material obtained from the Kasr-el-Ainy Hospital at Cairo and from autopsies at No. 3 Egyptian Stationary Hospital, Kantara. As all of the 47 cases studied died of some other disease—pneumonia, relapsing fever, dysentery, etc.—there is naturally a difficulty in separating entirely the conditions due to schistosomiasis and those caused by the other diseases. The paper is divided into three sections, the first dealing with the general pathology of schistosomiasis, the second and third with the detailed findings in *S. mansoni* and *S. haematobium* infections. The second is the most interesting section. The ova of *S. mansoni* are more widely distributed than is generally believed; they were found in the liver, pancreas, small intestine, vermiform appendix, retro-peritoneal tissues, lung, lymph-glands, brain, spinal cord, heart, and ovary, as well as in the rectum and bladder. Apart from the irritative reaction set up by the ova a toxin produced locally by the worm probably accounts to a considerable extent for the tissue changes present, especially in the liver.

R. T. L.

CAWSTON (F. G.). **Personal Experiences of Bilharzia Disease.**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 2. Vol. 26. No. 7. pp. 111–112.

Dr. Cawston accidentally infected himself with *S. haematobium* in April [1922?] when collecting or dissecting specimens of Physopsis. Early in May his blood showed an eosinophilia of 39·5 per cent., but not till December 27th did the ova appear in the urine. On January 8th he injected himself with ½ gr. tartar emetic in 1 cc. of tap-water, the following day ¾ gr. in 1½ cc., and on the third day 1 gr. in 2 cc., on the 12th 1¼ gr. Thereafter for ten days dead ova appeared in the urine. About a year later, as he had lost weight and the eosinophilia was still 15 per cent., the injections were renewed. Beyond "catarrhal" symptoms after the first series there were no untoward effects from the drug. This may account for the many instances in which the injections are discontinued on account of "influenza" supervening.

R. T. L.

MENDOZA-GUAZON (Maria Paz). **Schistosomiasis in the Philippine Islands.**—*Philippine Jl. Sci.* 1922. Dec. Vol. 21. No. 6. pp. 535–567. With 5 plates. [35 refs.].

The statement is controverted that *Schistosoma japonicum* does not occur in Manila, unless imported from the southern islands—Leyte, Samar, Mindanao—and even there it is uncommon. Ten fresh cases are recorded in detail, and seven of these patients were residents of Manila. *Blanfordia nosophora* has not been recorded in the Philippines, though, if it did exist, all the conditions favourable for endemicity and spread of the disease are present—warm climate, continuous rain, vegetation, bad conservancy methods, and the habit of the labourers of wading the rice fields barefooted and of eating partially cooked snails. Whether, therefore, some other host serves as intermediary or whether the snail is introduced in small numbers, being able to survive the short journey from Japan to the Philippines, is undecided.

R. T. L.

MELENEY (Henry Edmund) & FAUST (Ernest Carroll). **The Intermediate Host of** *Schistosoma japonicum* **in China.**—*Proc. Soc. Experim. Biol. & Med.* 1923. Vol. 20. No. 4. pp. 216–218.

The authors report the discovery of the intermediate host of *S. japonicum* in small canals, particularly terminal ones, in the Soochow district of the Kiangsu Province of China. Five per cent. of the snails collected from a canal near which many cases of schistosomiasis resided were infected; 31 days after immersion in water containing cercariae from these snails a mouse showed infection, and snails were infected after exposure to miracidia of *S. japonicum*. The shell is 6·4 mm. in length, acuminate, dextrally coiled with seven spirals, and of greater density than that of *Blanfordia nosophora*. This snail was not found in the rice fields, owing probably to the height of these fields above the level of the canals. Experiments showed that the Japanese and Chinese forms of *S. japonicum* are identical.

R. T. L.

LIBBY (W. E.). **Tartar Emetic in Schistosomiasis Japonica. A Preliminary Report.**—*China Med. Jl.* 1923. Feb. Vol. 37. No. 2. pp. 158–166. [9 refs.].

This is a record of eight cases of infection with *S. japonicum*. One refused to stay in hospital and had no treatment; the other seven were given tartar emetic. Of these the first received only one injection (½ gr.); the second died four days after his first injection (½ gr.); the third was sent home as a hopeless case after he had received a total of $6\frac{1}{12}$ gr.; the fourth received altogether 12 gr. in 50 days and was discharged "very little improved"; the fifth was still in hospital and had had $5\frac{11}{12}$ gr. during the month without amelioration; the sixth improved as regards his general condition after ten injections in seven weeks; the seventh died about 40 hours after his seventh injection in 14 days, the size of the last dose being 3 gr. and the total $12\frac{5}{8}$ gr. The author ascribes the death to the drug. Judging from this series, though small, the results of intravenous tartar emetic appear to be less successful in infections with S. *japonicum* than with other species.

R. T. L.

TROLLI. **Trois cas de Bilharziose traités par l'émétique.**—*Ann. Soc Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 175–177.

Though cases of "bilharzial dysentery" with terminal-spined ova have been reported at the native hospital at Kigoma, the author had never seen one of urinary schistosomiasis among the inhabitants of Kigoma and Ujiji. He gives an account of three cases, an Arab, a Hindu, and a native nurse at the European hospital. Treatment by injection of tartar emetic was given. The initial dose was 6 cgm. (in one case 12 cgm. was given by mistake), then 9 cgm. for two doses, and finally 12 cgm., the injections being administered every other day. The first proved resistant, and a total of 2·2 gm. was injected before the ova disappeared; the second received 1·55 gm., the third 0·88 gm. The first patient returned to Zanzibar and his subsequent history is not known; the other two have passed no ova for the 20 months during which they have remained under observation.

R. T. L.

MCDONAGH (J. E. R.). **The Treatment of Bilharziasis with Antimony**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 16. Vol. 26. No. 8. p. 119.

The author employs ampoules of 1 cc. containing 1½ gr. of tartar emetic, diluting to 30 cc. for intravenous injection, since concentrated solutions are apt to set up venous thrombosis. The usual number of injections needed is ten, given at five-day intervals. He claims priority for the introduction of antimony in the treatment of bilharziasis.

R. T. L.

DIAMANTIS. **La théorie périnéale de l'infection de l'homme par le** "*Schistosomum haematobium*" **et ses conséquences pratiques.**—*Presse Méd. d'Egypte.* 1922. Dec. 1. 12th Year. 2nd Ser. No. 78. pp. 1082–1085.

A paper of special pleading for a perineal route of infection by cercariae of *S. haematobium*, repeating more fully what the author wrote seven years ago, but unsupported by any experimental evidence.

R. T. L.

WATKINS-PITCHFORD (W.). **The Suppression of Bladderworm and Tapeworm Disease. (Blaaswoorm en Lintwoorm Ziekte.)**—*Med. Jl. S. Africa.* 1923. Mar. Vol. 18. No. 8. pp. 207–212.

The tapeworms from human subjects identified at the Institute in Johannesburg bear the following numerical relationship: *T. saginata,* 69; *T. solium,* 29; Hymenolepis, 2. No systematic effort has been made in the Union of South Africa to eradicate these infections. Hitherto the only public health measures adopted have been directed against the sale of meat containing bladderworms. The author holds that the disease in man and in animals should be regarded as one, and calls for the compulsory notification by doctors of cases of tapeworm infection to the local authority, and by veterinary, meat and sanitary inspectors and butchers of the discovery of measles, giving also the name of the breeder.

Of 139,899 cattle slaughtered in the Pretoria abattoir from 1914 to 1922, 1,134, *i.e.,* 0·81 per cent., were found with cysticerci. At Johannesburg the abattoir figures were 7,521 cattle infested, *i.e.,* 0·72 per cent. out of 1,030,795 cattle slaughtered in 11 years. Of 38,510 pigs slaughtered at the Pretoria abattoir, 3,490, *i.e.,* 9·06 per cent., were infested with cysticerci. Of 343,177 pigs slaughtered at the Johannesburg abattoir, 32,359, *i.e.,* 9·42 per cent., were infested. These figures do not include cases in which cysticerci were recognized in the living animal, which was thereupon returned to the owner as " fit for breeding purposes." There is an erroneous assumption that freezing or chilling for a few days destroys the cysticerci. Experiments made in the Johannesburg Institute indicate that hard freezing from 12 to 15 weeks is required to achieve this result. Since 1919, 13 cases of human infestation with cysticerci have been investigated at the Institute. In two the cysts were those of *T. saginata,* in the remaining 11 the cysts were of *T. solium.* Six of the cases terminated fatally from the presence of the cysts in the brain, and death had been certified as due to " epilepsy " or " cerebral haemorrhage."

Recently published statistics show that from 10–19 per cent. of all individuals in the Transvaal are the subject of tapeworm infestation. Precautions against the spread of the disease through the penalizing of uncleanly habits and the restriction of pigs to sties would remove an obstacle to the development of a staple industry of South Africa.

R. T. L.

i. JOYEUX (Ch.). *Hymenolepis nana,* **v. Sieb. and** *Hymenolepis fraterna,* **Stiles.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 502–504. [4 refs.]

ii. LANE (Clayton) & LOW (George C.). *Hymenolepis nana* **and** *Hymenolepis fraterna.* **(A Reply to M. Joyeux.)**—*Ibid.* pp. 504–508. [2 refs.]

iii. NICOLL (Wm.). iv. LEIPER (R. T.). **The Life-history of the Tapeworm** *Hymenolepis nana.* [Correspondence.]—*Lancet.* 1923. Apr. 21. p. 821; Apr. 28. p. 872.

i and ii. Joyeux maintains his view that *Hymenolepis nana* of man and *H. fraterna* of the rat are distinct forms, and replies to criticisms of Lane and Low in a recent article in a textbook on the Practice of Medicine in the Tropics, edited by BYAM and ARCHIBALD. He points out that some other tapeworms develop to the cysticercoid stage in the definitive host, *e.g.*, *Hymenolepis erinacei* and *Anomotaenia zederi*, and that he failed to infect adult fleas and flea larvae of different species with the eggs of *H. nana* of man. In reply, Lane and Low state that they had overlooked the detailed description of Joyeux's work, and had relied on an earlier summary. Criticizing this definitive paper, they state that there is no evidence that the experimental animals were freed from possible intermediate hosts, that his parasite-free strains of rats became contaminated in spite of the precautions taken, and that Joyeux's experiments may be used to uphold the theory that indirect infection can occur. In the cases quoted by Joyeux of the occurrence of a cysticercus in the same host as the adult, there is no evidence that the cysticercus will develop a strobilus direct without first leaving the host and being afterwards eaten.

iii and iv. In a letter to the *Lancet* Nicoll states that the Review on " Medical Helminthology " in this *Bulletin*, Vol. 20, No. 2, pp. 85–91, gives a misleading account of his work on Hymenolepis in rat fleas. He does *not* claim that the forms described by MINCHIN and himself in 1911 from fleas belong to the species of Hymenolepis known as *H. nana*.

R. T. L.

UCHIMURA (Ryoji). **[On the Development of** *Hymenolepis nana* **and** *Hymenolepis murina*.]—*Jikwa Zasshi* (*Jl. of Pediatrics*). 1922. Sept. No. 268. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 53.]

The eggs of *Hymenolepis nana* and *H. murina* develop into cysticercoids in the mucosa of the intestine of the white rat. Morphologically also these two species cannot be distinguished in the adult form, as larvae or eggs. They do not differ in the route of infestation, and the author concludes that these species must be considered to be identical.

R. T. L.

KATSUNUMA (S.). *Hymenolepis diminuta* **in Japan.**—*Trans. 4th Congress Far Eastern Association Trop. Med.* 1921. Vol. 1. pp. 482–484.

The author reports on a specimen of *H. diminuta* from a child, four years of age, believed to be the first recorded in Japan, although the ova have been noted on several occasions. Subsequently two other instances of the passage of the worm in the faeces were brought to his notice.

R. T. L.

GAUTIER (P.). **Un cas de méningite vermineuse.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1923. Mar. 22. 3rd Ser. 39th Year. No. 10. pp. 429–432. [4 refs.]

A boy, five years of age, was sent to hospital with very definite symptoms of meningitis (as opposed to meningism)—headache, vomiting, rigidity of neck, positive Kernig's sign, albumen in the cerebro-spinal fluid, and increase of cells up to 400 per cmm. The symptoms rapidly improved in 48 hours after expulsion of *Taenia solium* by Filix mas, and the child was discharged cured on the fifth day.

R. T. L.

CARBONELL (Manuel V.) & ZWANCK (Alberto). **Profilaxis de la hidatidosis.** [Prevention of Echinococcus Infection.]—*An. del Depart. Nac. Hig.* Buenos Aires. 1922. Sept.-Oct.-Nov. & Dec. Vol. 28. No. 5 & 6. pp. 303-313. With 1 chart.

In 1901 VEGAS and CRANWELL reported that 40 per cent. of the pigs killed in the slaughter-houses of Buenos Aires were infested with echinococcus. Though less now in these animals, there has been an increase in the numbers of cattle and sheep infected, and the mortality curve of hydatid disease in man has followed closely the incidence curve in sheep. In 1906 more than 5 per cent. of the dogs were found to be harbouring the cestode, and cattle become infected from contamination of the pastures, water, etc., by their faeces. To treat all the dogs is impossible, and the only solution of the problem is to prevent them eating the flesh of animals containing fertile cysts. With this aim in view a resolution was passed at the Second National Medical Congress in 1922 suggesting legislation to prevent dogs frequenting slaughter-houses, and to compel the destruction of all infected meat.

H. Harold Scott.

ANDO (Akira). [**A Contribution to the Study of** *Sparganum mansoni.* **II. Communication. On** *Sparganum mansoni* **found Infesting the Domestic Fowls.**]—*Iji-Shimbun* (*Med. News*). 1922. Oct. No. 1104. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 31.]

In 11 domestic fowls from villages near Kyoto specimens of *Sparganum mansoni* were found. These had the same morphology as those described from man and frogs. Five dogs were fed, each with two of these parasites from the fowls, and in two of the dogs fully grown adult forms were afterwards found. The English abstract does not say anything regarding the specific characters of these adults.

R. T. L.

ANDO (Akira). [**On** *Sparganum mansoni* **found in the Testicle.**]—*Nihon Hitsunyokibyo Gakkwai Zasshi.* (*Jl. Japan Urol. Soc.*) 1922. Sept. Vol. 11. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. pp. 56-57.]

The author reports a rare case of *Sparganum mansoni* infesting the testicle. After removal he fed the worm to an experimental animal, in which it grew to an adult form, agreeing completely with the adult described by YAMADA.

R. T. L.

HUTCHISON (Robert). **The Treatment of Intestinal Worms.**—*Lancet.* 1923. Apr. 14. pp. 762-763.

As a purgative after Filix mas for eradication of tapeworms castor oil is better avoided, as some poisonous constituents of the drug are soluble in it. The author, however, found a German preparation (not obtainable since the war), Filmaron, very successful. This consists of the active principle of male fern dissolved in castor oil, the dose for an adult being ½ oz.

R. T. L.

LUNDSGAARD (K. K. K.). **Er Neosalvarsan et Baendelormemiddel?** [Is Neosalvarsan a Remedy for Tapeworm?]—*Hospitalstidende.* 1923. Vol. 66. No. 10. p. 190.

A man of 67, originally admitted to hospital for a cataract operation, developed abdominal pain. Appendicitis was excluded, but no definite diagnosis was made. He had some ophthalmic complications—glaucoma and irido-cyclitis. Eventually, when signs of sympathetic ophthalmia appeared, treatment with neosalvarsan was begun. Intravenous injections of 0·3, 0·3, 0·45, 0·6, and 0·9 gm. were given on successive days. Twelve days after the last dose a much decomposed strobila of *Taenia saginata* was passed. Further pieces of the tapeworm were evacuated during the next few days.

The interesting question is whether the neosalvarsan killed the parasite, which seems probable in view of the toxicity of the drug and of the fact that it is excreted partly by the intestine (diarrhoea is occasionally caused by the injections).

E. E. Atkin.

HETHERINGTON (D. C.). **Some New Methods in Nematode Technique.** —*Jl. Parasit.* 1922. Dec. Vol. 9. No. 2. pp. 102–104. [3 refs.]

As a rapid and reliable fluid for killing, clearing and dehydrating nematodes the following, designated "Carnoy-phenol," is recommended :—

Absolute alcohol	20 cc.
Chloroform	15 cc.
Glacial acetic acid	5 cc.
Phenol crystals to raise the volume by ..	10 cc.
Total	50 cc.

The mixture is very corrosive, and must be kept in glass-stoppered bottles, but not stored for longer than two weeks. Nematodes may be taken from 70–80 per cent. alcohol, glycerine, lacto-phenol or formol and placed in the fluid, from which the specimens may be prepared either for sectioning or for mounting in balsam. Oil of wintergreen is slowly and thoroughly mixed with the specimens. After 10–15 minutes they may be infiltrated by paraffin. The wax is shaved into the dish containing the specimens in the clearing fluid and set aside in a warm place for two hours, after which the worms should be transferred to pure paraffin for melting at 58° C. for embedding. For mounting in balsam a technique is given by which a specimen is transferred slowly to balsam after clearing in oil of wintergreen. Diaphane "is said to be an excellent resinous medium for very transparent work." Specimens which have become dry through breakage of the glass container or imperfect sealing should be soaked in 35–50 per cent. alcohol, to which an equal volume of lactic acid has been added. The acid should be removed afterwards by thorough rinsing in 70 per cent. alcohol.

R. T. L.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **Miscellaneous Tests of Carbon Tetrachlorid as an Anthelmintic.**—*Jl. Agric. Res.* Washington. 1923. Jan. 20. Vol. 23. No. 3. pp. 163–192.

A valuable record of a large number of tests as to the anthelmintic properties of carbon tetrachloride. Tests of the effective, the optimum, the tolerated and the toxic doses were carried out on chickens, rabbits, dogs, cats, foxes, swine, sheep, cattle, monkeys, and the results of administration to horses and man noted. The paper is too full of detail to permit of an adequate summary; suffice it to say that the drug is very effective in removing blood-sucking strongyles; on Ascarids the effects vary with different species. In man it is *less* efficacious than oil of chenopodium. It will expel Trichuris if this can be exposed to the action of the drug. Finally, it is cheap, is a simple compound, and can be easily tested as to its chemical purity. Untoward symptoms rarely arise if it is given in hard capsules, whereby too early solution and consequent inhalation are avoided.

R. T. L.

ROY (S. K.). **Strongyloidosis.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. pp. 155–158. With 13 figs.

Strongyloides stercoralis occurred in 49 cases out of 300 (16·3 per cent.) examined at the Puri Jail and Sadar Hospital in Orissa. The author describes newly hatched strongyloides larvae and later stages. He states that when present in small numbers these parasites may give rise to no symptom other than intestinal catarrh and a slight tendency to diarrhoea. Although the patient may be healthy-looking and even fat, there is a loss in average weight and the haemoglobin varies from 40 to 60 per cent. Carbon tetrachloride is of little value, and as yet no suitable remedy has been found.

R. T. L.

HEMSEN. *Anguillula intestinalis* **als Ursache einer schweren sekundären bezw. perniziösen Anämie.** [*Strongyloides stercoralis* as a Cause of Severe Secondary Anaemia.]—*Deut. Med. Woch.* 1923. Jan. 19. Vol. 49. No. 3. pp. 83–85. [9 refs.]

Two subjects, aged 40 and 21 years respectively, passed blood in their stools, and no cause, other than the presence of this parasite, could be found for their condition. In the first the anaemia was of the pernicious type: red cells 960,000, haemoglobin 20 per cent., leucocytes 5,000, eosinophiles 0·6 per cent. Blood transfusion was performed on two occasions, but the patient succumbed. In the second there was a different type. On admission there were 4,300,000 red cells, Hb 72 per cent., leucocytes 11,000, eosinophiles 1·3 per cent. Six weeks later, though blood had been passed daily, the count was 3,300,000, Hb 52 per cent, leucocytes 35,000, eosinophiles 82·6 per cent. The patient on leaving hospital was still harbouring the worm, in spite of varied treatment, and the blood examination gave red cells 3,100,000, Hb 41 per cent., leucocytes 6,300, with 37·6 per cent. eosinophiles.

R. T. L.

ROBERT (Léopold). **La Gnathostomose humaine, Oedème ambulant siamois dû à** *Gnathostomum spinigerum* **(R. Owen, 1836.)**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 854–860. With 5 text figs.

Gnathostomum spinigerum, a common intestinal parasite of dogs and cats, has been found twice as an aberrant form in the connective tissue in man in Siam. The author in this paper contributes clinical notes on three additional cases. The parasite, when present in the subcutaneous or deeper tissues, gives rise to a migratory elastic oedema with painful irradiations, which is highly characteristic and is well known to all Siamese, although not hitherto described in medical literature. The parasite tends to extrude itself, but the skin is not the only point at which this may take place. It is noted that in one case the parasite was discharged from the tongue, in another it escaped in the neighbourhood of the pharynx. The diverse symptoms, such as haemoptysis, haematemesis, haematuria, which can undoubtedly be attributed to the migrations of this parasite render it one of great practical interest in tropical countries.

R. T. L.

BLACKLOCK (B.). **The Signs of Filarial Disease.**—*Ann. Trop. Med. & Parasit.* 1922. July 20. Vol. 16. No. 2. pp. 107-117. With 1 text fig.

So varied in character and so diverse in their relationship to the presence of microfilaria are the signs of filarial disease that some definite mode of tabulation is desirable for purposes of comparison. The author examined 240 cases at Mabaya, Sierra Leone, and has analysed the filarial signs in these in accordance with the standard previously established by STEPHENS. The results show that "in this series many of the 'signs of filarial disease' have no more correlation with the presence of microfilaria in the blood than has hernia; some have less."

R. T. L.

ROY (S. K.). **Further Notes on Filariasis.**—*Indian Med. Gaz.* 1923. Feb. Vol. 58. No. 2. pp. 56-58. With 13 text figs.

An account of two cases of filarial affection of the scrotum, in one of which ova in various stages of development were seen in the lymph. From this fact the writer infers that filariae are oviparous. During two years when lymph oozing was fairly free there was no fever, but when the flow was stopped by operative measures the fever returned.

R. T. L.

COURTNEY (B. J.). **The Association of Certain Common Complaints as seen in Native Hospital Patients with the Presence of Microfilariae in the Blood.**—*Jl. Trop. Med. & Hyg.* 1923. Mar. 15. Vol. 26. No. 6. pp. 87-89.

Though many natives in Northern Nigeria have microfilariae in their blood, the Annual Returns show only a few cases of filariasis. Examination of patients reporting sick with muscle pains and swelling, deep-seated abscesses, and, in one case, with rigor, vomiting, abdominal pain and localized swelling (at first thought to be an appendix abscess) proved the presence of filariasis. The author thinks that these conditions are not merely associated with, but caused by, the filaria.

R. T. L.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1923. Vol. 63. No. 1. pp. 31–47. With 1 map in text.
i. **Beknopt overzicht betreffende de filariaverspreiding in Nederlandsch-Indië.** [Concise Review of Filaria Distribution in the Dutch East Indies.]
IBID. pp. 164–167. ii. **Aanvullingen van het overzicht van het filariaonderzoek onder de Atjehsche bevolking in het Gouvernement Atjeh en Onderhoorigheden gedurende 1922.** [OOSTINGH (R.).] [Additional Report.]

Both reports confirm the prevalence of infection with *Filaria bancrofti* in Atchin and Djambi in comparison with other parts of the archipelago. Of the people found infected only few showed symptoms of filariasis, *e.g.*, in Djambi 8 out of 67. Judging from the low incidence in soldiers in the endemic regions, there seems to be no great danger of infection.

Treatment with tartar emetic did not cause any improvement (two cases). For the purpose of diagnosis concentration after haemolysis was found not to give better results than the ordinary thick drop examination.

W. J. Bais.

BANERJI (R. N.). **Filariasis and Haemoptysis.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. pp. 165–166.

In a case of a Mohammedan lady, aged 52, suffering from haemoptysis at irregular periods, microfilariae were occasionally found in the sputum. Large numbers were present in the blood at night. The haemoptysis occurred suddenly and disappeared within 24 hours. No tubercle bacilli were ever found in the sputum or blood. There has been no rise of temperature, nor loss of weight or appetite, and no signs of chest lesions. The author enquires if the presence of embryos in the sputum is accidental or associated with the condition.

R. T. L.

NATTAN-LARRIER (L.). **La thrombo-lymphite filarienne du canal thoracique.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 412–416. [1 ref.]

An account is given of the histological changes found in tissues sent from Hayti of a case of filariasis. The thoracic duct contained an adult filaria which apparently was still alive when the autopsy was performed. There were signs of an extensive endolymphangitis in the duct and the collateral branches, and thrombosis arose from the toxin of a supervening septicaemia, which itself was the immediate cause of the patient's death, though its origin was not discovered.

R. T. L.

BIGLIERI (R.). **Nouvelles observations sur la Microfilaire de Tucuman.**—*C.R. Soc. Biol.* 1923. Feb. 10. Vol. 88. No. 5. pp. 362–363. [3 refs.]

Microfilaria tucumani, found in 1914 in the province of Tucuman (Argentine), has been found again by the author in 43 out of 200 people examined. It possesses a striated sheath like the Microfilaria bancrofti, but it was without periodicity. It is very narrow, usually 3μ and not exceeding $3{\cdot}30\mu$. The author gives a somewhat vague account of the various coloured spots in these embryos. Treatment with tartar emetic reduced somewhat the number of embryos after several intravenous injections.

R. T. L.

CONNAL (A.) & CONNAL (S. L. M.). **[The Development of** *Loa loa* **(Guyot) in** *Chrysops silacea* **(Austen) and in** *Chrysops dimidiata* **(Van der Wulp).]** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. p. 437.

The authors' previous statement [see this *Bulletin*, Vol. 19. p. 654] that the larvae of *Loa loa* develop in the muscular and connective tissues of the flies *Chrysops silacea* and *C. dimidiata* has to be modified somewhat. Beautiful sections, prepared by Dr. A. C. STEVENSON from flies supplied to him, make it perfectly clear that most of the larvae are in the fatty tissue, the so-called "fat body." It appears highly probable that KLEINE's developmental forms found "in the fatty connective tissue surrounding the abdominal cavity" were, as he presumed, stages in the development of *Loa loa*.

R. T. L.

STONES (R. Y.). **The Development of** *Loa loa* **in Chrysops.** [Correspondence.]—*Brit. Med. Jl.* 1923. Jan. 13. p. 82.

At Yambio, in the Bahr el Ghazal province of the Southern Sudan, the author found Chrysops in fair number, but did not find any case of Calabar swellings among the natives. Two years later, however, one of the men with whom he had lived in Yambio reported that he had suffered since from peculiar swellings and irritations in his hands and arms, which had been diagnosed as Calabar swellings. The patient had never been in West Africa, and after leaving Yambio went to Australia via Egypt.

R. T. L.

OUZILLEAU. **L'éléphantiasis au Congo et l'***Onchocerca volvulus*.—*Presse Méd.* 1923. Apr. 14. Vol. 31. No. 30. pp. 617–622. With 13 text figs. [6 refs.]

Examination of a large number of natives in the Congo revealed the fact that some 40 per cent. were harbouring *Onchocerca volvulus*. In Upper Oubangui all the cases of elephantiasis observed (79 in number. 3 per cent. of the whole) were similarly parasitized.

One hundred and eighty-two patients with elephantiasis of genitals were operated upon with excellent results, both aesthetically and functionally, and there were only four fatalities. The operation is described in detail with illustrative photographs and diagrams. No anaesthetic is used ; " general anaesthesia is not necessary and injections of cocaine are dangerous, as liable to cause syncope."

Microphotographs of sections of the elephantoid skin are reproduced, and show the microfilaria of *O. volvulus* in the papillary and subpapillary layers.

Other conditions ascribed to onchocerciasis are a cutaneous pseudo-ichthyosis and lichenization, possibly craw-craw, some forms of keratitis, and various arthropathies and nutritional disturbances.

R. T. L.

LAIGRET. **Un cas d'Onchocercose observé à l'hôpital de Brazzaville.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 303–305. With 1 text fig.

By puncture of a cystic swelling, situated over the eighth rib in the left mid-axillary line in a native, aged 35 years, numerous embryos of *Onchocerca volvulus* were obtained. There were no other cysts discovered, but an elephantoid condition of the legs and two venous varices of the abdominal wall were present. The cause of the latter could not be determined.

Examination of the blood revealed a few embryos of *Filaria perstans*. There was no evidence to support the hypothesis that the varices were associated with deep-seated onchocerca cysts.

R. T. L.

MONTPELLIER (J.) & LACROIX (A.). **Nouvelle note au sujet de la "Gale filarienne."**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 815–818. [1 ref.]

A reply, partly in the nature of criticism and rejoinder, to a paper on the subject of dermal onchocerciasis by OUZILLEAU, LAIGRET and LEFROU [see this *Bulletin*, Vol. 19, p. 231]. Five points are dealt with : (1) The discharge of embryos is not continuous, but intermittent, so that, whereas OUZILLEAU reports their constant presence, the authors found them only at times. (2) The rash, particularly the "zones d'achromie en tache," which the former regards as due solely to onchocerciasis, may be met with in other leucodermic states, *e.g.*, leprosy, syphilis, yaws. (3) The "pseudo-icthyosis" associated with onchocerca, they maintain, is not difficult to distinguish from lichen tropicus and similar conditions, whereas OUZILLEAU does not regard it as characteristic. (4) The local lesions are ascribed by OUZILLEAU directly to the action of the embryos, whereas the authors consider them to be the results of scratching induced by the itching. (5) They discuss the advisability of retaining the term " craw-craw " as a distinct condition.

R. T. L.

CALDERÓN (Victor Manuel). **Contribucion al Estudio del Filárido onchocerca sp. Dr. Robles, 1915, y de las enfermedades que produce.** [Onchocerca sp. Dr. Robles, 1915, and the Diseases Caused by It.] [Doctorate Thesis, 1919.]—107 pp. With 1 map & 35 other figs. 1920. June. Guatemala : Tipografia Sanchez & de Guise.

In the first part of this work a description is given of a Nematode differing from *Onchocerca volvulus* in certain particulars, together with an account of the associated disease. In the second part the eye conditions to which it gives rise are dealt with in greater detail. This "American Onchocerca" was discovered by Dr. ROBLES in the environs of Guatemala in 1915. It predominates at heights between 2,800 and 3,600 ft. above sea-level, where, on some estates, over 70 per cent of the inhabitants are infected. The following table shows the chief differences between the *O. volvulus* and the new species :—

——	*O. volvulus.*	New Species (*O.* sp. Dr. Robles, 1915). *O. caecutiens* Brumpt, 1919.
Size of Tumour	Up to that of a pigeon's egg	Up to 23 mm. long, 18 mm. broad.
Geographical Distribution.	Africa ; on river-banks and about sea-level.	American Continent ; at an altitude of 1,800 to 4,000 ft.
Eggs	Polar prolongations, like an "orange wrapped in tissue paper with twisted ends."	Round or oval, 48 to 56 microns.
Embryos ..	Average, 300 microns ; no sheath, pointed tail ; V-spot at junction of anterior one-fifth with posterior four-fifths.	240–270 microns long, by 6 microns broad ; no sheath, pointed tail ; clear space at anterior ¼, and two others close together near posterior extremity.
Male	3–3·5 cm. long by 0·13 mm. broad ; three papillae each side of the cloaca, three pairs of post-anal papillae ; two unequal spicules.	Average, 23 mm. long by 0·13 mm. broad ; one spicule only, with an additional piece about half the size and apparently adherent to the wall of the cloaca and not protrusible.
Female ..	6–7 cm. long, by 0·30 mm.; vulva, 700 microns from anterior end.	Varies from 6 to 32 cm. in length ; vulva, 370–430 microns from anterior end.

The tumours varied in number from 1–19, and were almost always found on the head, usually, but not invariably, above the aponeurosis, their situation indicating, in the author's opinion, that infection is conveyed by some nocturnal biting insect. The author's method of obtaining the nematode was to excise a tumour, attach a thread to it, and administer it to a dog and withdraw it after partial digestion had liberated the parasite, or, in case the animal bit through the thread and retained the tumour, the dog was killed in 3–4 hours, and the partly digested tumour examined.

The mode of transmission has not yet been worked out ; water, lice, mosquitoes, and various flies were all tested, but none yielded positive results.

The condition set up is of an erysipelatous nature, though suppuration does not occur. As a rule, the swellings are painless ; " erysipelas " only arises in tumours containing both male and female, and it is believed that the acute state is due to the discharge of embryos into the circulation, though the author has not been able to verify this, as the patients did not come under his notice sufficiently early. At the onset there is a rise of temperature to 38°·5–39° C., with intense headache, but no rigor nor enlargement of lymphatic glands. When the cases came under observation the features were swollen and discoloured, the eyes closed, partly from swelling, partly owing to photophobia and blepharospasm. Within 7–8 days after excision of the incriminated tumour all the symptoms cleared up.

Some cases do not present such an acute onset, but are, as it were, chronic from the start. The skin becomes gradually thickened with the formation of rugae, and of a pallid, greenish tinge, with oedema. There may be exacerbations of these symptoms at intervals of one or two months. Eye-symptoms commonly associated are punctate keratitis, corneal leucoma, acute or chronic iritis, photophobia, pigmentation of sclerotics, and considerable impairment of vision. These symptoms are said to be due to a toxin liberated by the parasite. There is a marked eosinophilia of 50 per cent. or over. [See also this *Bulletin*, Vol. 14, p. 157.]

H. Harold Scott.

TOURNIER (E.). **Le traitement du Ver de Guinée par les sels d'antimoine.** —*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 809–815. [4 refs.]

Owing to the disadvantages associated with the use of the tartar emetic—pain when administered intramuscularly, discomfort and vomiting when taken *per os*, uncertainty of action by the intravenous route—the authors employed "Kermès"* in doses of 15–20 cgm. in water daily for children, 40 cgm. for adults, and found that it is quite as active therapeutically as tartar emetic, facilitates extraction and favours expulsion, prevents septic complications, and improves the general condition of the patient. Brief details are given of 17 cases.

R. T. L.

DUFF (D.). **Short Note on the Use of Antimony Orally in the Treatment of Guinea-Worm.**—*Gold Coast Rep. on the Med. Dept. for the Year 1921. Appendix B.* p. 53.

Owing to the objection evinced by many natives to even such a minor operative procedure as intravenous injection, Dr. Duff treated several cases [number not given] of guinea-worm infection with tartar emetic by mouth, with very satisfactory results. The drug (gr. 10) was made up in a 10-oz. mixture with 2½ drs. of sodium bicarbonate. The patient was directed to pour 2 oz. of this into a whisky bottle, to fill it up with water, and drink it during the day in small quantities so as to avoid nausea and vomiting. A second course was given if the worm was not killed; if this also proved ineffectual resort was then had to the intravenous route, 4½–6 grs. being thus administered, so that the total, 26 grs., did not exceed the toxic limit.

R. T. L.

---

* Kermes mineral = Stibium sulfuratum rubrum, consisting chiefly of antimony trisulphide.

KOINO (Sui). **[Experimental Infection with Ascaris in Human Body, with Special Reference to the Clinical Symptoms of Ascaris Pneumonia. (A Preliminary Report.)]**—*Tokyo-Iji-Shinshi* (*Tokyo Med. News*). 1922. Oct. No. 2299. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 30.]

A robust young man, aged 21, was given 500 eggs of *Ascaris suum* [*suilla*], and the author himself swallowed about 2,000 eggs of *Ascaris lumbricoides*. In the former a slight form of pneumonia developed on the ninth day after feeding, and there was shivering, cold, with rise of temperature to 39·1° C. In the author's case a slight rise of temperature set in on the third day. On the sixth day fever, with shivering, developed, lasting for nine days with a maximum temperature of 40·2° C. From the fifth day the pneumonic symptoms were so severe that his life was in danger. In the case in which *Ascaris suum* eggs were used no larvae could be demonstrated in the sputum, but in the author's case a larva was found in the sputum on the third day, and these increased in number so that on the evening of the fifth day 178 larvae were counted in 155 cc. of bloody sputum. The author is of opinion that the ascaris larvae from the pig and from man migrate in the human body as in experimental animals, producing the same pathological changes. The larvae may desquamate during their migration.

R. T. L.

TOCHIHARA (Isamu) & TAKAGI (Shyozo). **[On the Transmigration Route of the Larvae of Ascaris in the Animal Body. I. Communication.]**—*Saikingaku Zasshi.* (*Jl. of Bact.*). 1922. Sept. No. 324. [Summarized in *Japan. Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 54.]

The authors fed mice with a number of fully matured eggs of ascaris, and at various intervals the animals were killed for examination. It was found that the eggs hatch in the lumen of the intestines, whence the larvae bore through the intestinal walls and reach the mesentery through the lymphatic system. Some then penetrate into the mesenteric glands. A few which found their way into the peritoneal cavity bore into the liver, in which case some went into the hepatic veins. Sections of the stomach demonstrated the larvae in the act of piercing the wall.

R. T. L.

COPPIN (H.). **Accidents pseudo-comateux et rétention d'urine par ascaridiose.**—*Bull. Soc. Méd. Chirurg. Indochine.* 1922. Oct. Vol. 1. No. 1. pp. 2–6.

A boy of 15 years was suddenly attacked by somnolence and retention of urine. There were no definite symptoms of organic disease. Twenty-four ascarides were expelled by santonin within four days; the patient gradually recovered, and in a week from the onset was in his usual health. The description is strongly suggestive of an hysterical condition, but the author thinks it simpler to ascribe the symptoms to "reflex phenomena of intestinal origin acting on the bladder innervation," and due to, not merely associated with, ascarides.

R. T. L.

GUIART (J.). **[Ascaris outside of Human Intestine.]**—*Jl. de Méd. de Lyon.* 1922. Dec. 20. Vol. 3. No. 71. p. 747. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Feb. 24. Vol. 80. No. 8. pp. 587–588.]

By addition of human blood to normal saline and changing the solution twice daily, Guiart kept specimens of ascaris from the human intestine alive for several days.

R. T. L.

OGATA (Seiji). **[A Study on the Development of Ascaris. I. Communication.]**—*Tokyo-Iji-Shinshi* (*Tokyo Med. News*). 1922. Aug. No. 2293. [Summarized in *Japan Med. World.* Tokyo. Dec. 15. Vol. 2. No. 12. p. 346.]

The original of this paper is in Japanese and the English review merely states that the paper deals with the conditions best suited for the development of the ascaris eggs and the young larvae and on the staining of these larvae, but no details are given.

R. T. L.

SCHMIDT (W. Th.). **Neue Beiträge zur Oxyuriasis.**—*Münch. Med. Woch.* 1923. Apr. 20. Vol. 70. No. 16. pp. 495–496. With 1 chart in text. [4 refs.]

The author, after testing his blood for eosinophiles and finding the percentage normal, infected himself with oxyuris (3). The number of eosinophiles rose after the first week, and by the end of the fifth week was 28 per cent. Thereafter until the ninth week it fell, and he reinfected himself. An increase again occurred, but never above 17·5 per cent., and the curve of rise and fall was irregular and did not return to normal for some three months.

A second contribution consists of a report of a case of a fistula, opening 6 cm. below and to the right of the umbilicus and communicating with the ascending colon. discharging oxyuris in large numbers. Examination of the excised track revealed numerous ova in the walls and in tributary passages.

R. T. L.

EASTWOOD (E. H.). **The Relation between Appendicitis,** *Oxyuris vermicularis* **and Local Eosinophilia in the Appendix Wall.**—*Jl. Path. & Bact.* 1923. Jan. Vol. 26. No. 1. pp. 69–81. [46 refs.]

This paper is a contribution towards the solution of two problems, viz., (*a*) the relation, if any, as cause and effect, between appendicitis and the presence of *Oxyuris vermicularis* in the appendix; (*b*) the significance of local appendicular eosinophilia.

As regards (*a*), the evidence adduced goes to show that no such relation exists. Of 73 cases of appendicitis the parasite was found in 14, while of 50 normal appendices it was found in a like number, *i.e.*, relatively more often in the normal than in the inflamed viscus.

As regards (*b*), eosinophiles were present in a proportion of about 8 per cent. in normal appendices and 12 per cent. in those in which the parasite was found. In inflammatory conditions, however, the number was always high, rising to 21 per cent. in 24 hours, to 58 per cent. in the second week, then gradually decreasing with recovery. In cases of appendicitis associated with oxyuris there is a similar rise, but not quite so high. Local eosinophilia occurs in many conditions, and is, therefore, not pathognomonic of local helminth infection.

R. T. L.

HAJOS (Karl). **Die Behandlung der Oxyuriasis mit Salvarsan.** [The Treatment of Oxyuriasis with Salvarsan.]—*Med. Klin.* 1922. Dec. 17. Vol. 18. No. 51. (No. 941.). pp. 1619–1620.

A woman, 27 years of age, who had suffered four years with oxyuris infection which persisted in spite of all the usual forms of treatment, was given 0·9 gm. salvarsan by mouth. A large number of worms were expelled, and, though frequent examinations were made, no more appeared for eight months. Another similar dose was then given, and since that time (ten months) there has been no recurrence. Salvarsan or neosalvarsan has been since employed in six other cases with equally good results.

R. T. L.

LANE (Clayton). **On Ankylostome Infestation : the Changing Problem.** —*Brit. Med. Jl.* 1923. Mar. 31. pp. 551–553. [15 refs.]

This is a stimulating discussion of some aspects of the hookworm problem as it stands at present. The writer shows that there is no conclusive evidence either for or against the opinion, which prevails largely, that less than ten worms are innocuous. He also controverts the statement that the microscope fails to detect 50 per cent. of light infestations, and holds that by his " standardizing count " the examination of 1 cc. of stool can detect infestation by a single normally ovipositing ankylostome. The prevalent idea that hookworm larvae are widely disseminated in the soil is next taken up, and experiments are quoted demonstrating that the condition is a localized ground infection, a " privy infection " in the wide sense.

The illogicality of the statement so generally made that, because an anthelmintic removes in two treatments 97 per cent. of the number of worms evacuated by three treatments, therefore this is the percentage of *all* the ankylostomes originally harboured, is demonstrated. Lastly, stress is laid on the fact that treatment and prevention lag far behind diagnosis, and that much of the work which has been done will have to be done again.

R. T. L.

STEKHOVEN (Schuurmans J. H.) & STEKHOVEN-MEYER (Schuurmans A. W.). **Anchylostomiasisbekämpfung und Bodeninfektion.** [Ankylostomiasis Campaign and Soil Infection.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 485–495.

The percentage of infection in various parts of Java varied between 40 and 100. The inhabitants of the most infected districts were sallow, anaemic, and of poor physique. Of the inmates in the Tulungagung Hospital over 90 per cent. were passing ova. In most districts defaecation was performed anywhere on the ground, but mostly under bamboos, and in such situations, protected from the sun's rays, soil infection was heavy. The soil round privies exposed to the sun was usually sterile. In one village there was a spring, and women and children stood in the water to wash clothes, and the neighbourhood of this spring was treated as a public latrine. The larvae were very abundant in the soil here. Intensive sterilization of the soil [by a method not stated] was found of little use without at the same time carrying out mass treatment. Better latrines were being provided and the ground around them and the springs cemented, but at the time of this report it was too early to look for definite results.

R. T. L.

SCHWARTZ (Benjamin) & TUBANGUI (M. A.). **The Prevalence of Hookworm and other Intestinal Nematodes in Adult Filipinos.**—*Jl. Parasit.* 1922. Dec. Vol. 9. No. 2. pp. 83–92. [23 refs.]

The faeces of 649 students of the University of the Philippines, drawn from 46 provinces and subprovinces, were examined for the presence of nematodes ; 84·76 per cent. were found infested with one or other of these parasites ; 48·69 per cent. with hookworm, but producing no apparent ill-effects. This is ascribed, not to racial immunity of the Filipino, but to the small numbers of infesting parasites. 35·28 per cent. were found to harbour ascaris. This number is lower than that given by previous investigators, who dealt with children as well as adults, and the former show a higher rate of infection. Trichuris was present in 55 per cent.

R. T. L.

VALENZUELA (A. J.). **Ankylostomiasis. I. Noticias sobre su existencia en el Ecuador. II. Algunas consideraciones sobre la patologia i la biologia del parásito. III. Tratamiento i dietética.**—Trabajo presentado al 6º Congreso Médico Latino-Americano reunido en la Habana del 19 al 26 de Noviembre de 1922. 24 pp. Guayaquil : Libreria e Imprenta La Reforma.

The general symptoms of ankylostomiasis were known to the aborigines, who treated the cases with "*paico*," which is nothing else than *Chenopodium abrassoides*. In 1922 some 40 per cent. of the cases examined at the hospital at Guayaquil were harbouring the hookworm, those most affected being workers in the rice fields and in the cocoa, coffee, and sugar plantations. Five forms of the disease are described : latent, benign, icteric, dysenteric, and nephritic.

The second part of the paper does not contain anything new. Oil of chenopodium was used for patients in fair general condition ; for severe cases thymol was preferred. The "standard dose" of the latter was 3 gm., put up in six gelatin capsules, each containing 50 cgm. Three were given at 9 p.m., the remainder at 10 p.m., the patient having had the ordinary diet about 5 o'clock, and between 6 and 7 a.m. on the following day 45 gm. of magnesium sulphate in a single dose. The procedure is repeated after three or four days, as many as six times if necessary.

In severe cases with oedema a non-salt regimen is imposed and carbohydrates are reduced. Iron, haemoglobin, strychnine and arsenic are prescribed if the symptoms demand them.

H. Harold Scott.

LANE (Clayton). *Ancylostoma braziliense.*—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 347–352. With 1 fig. [9 refs.]

From a study of material from Brazil and Bengal further confirmation has been obtained that *Ancylostoma ceylanicum* is identical with *A. braziliense*, the differences which have been held to separate these as species being greatly variable individual distinctions.

R. T. L.

MHASKAR (K. S.). **The Diagnosis of Hookworm Infection.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 665–686. [16 refs.]

The author, who is officer-in-charge of the Ankylostomiasis Inquiry, Trichinopoly, undertook the investigation of the efficiency of the various methods suggested and employed for the diagnosis of hookworm infection by faecal or blood examination, and concludes that faecal examination for ova is the surest, and that the most "simple, practicable, rapid and accurate" is the flotation method—"mixing faeces or the sediment from a centrifuged specimen on a slide with a mixture of saturated solution of common salt or magnesium sulphate with glycerin, the top of the slide being examined for ova."

R. T. L.

MHASKAR (K. S.). **A Note on the Correlation between Humidity and the Intensity of Hookworm Infection in Southern India.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 821–824. With 1 chart in text.

A table is given of the numbers of ankylostomes removed from prisoners in the Trichinopoly gaol month by month for nearly five years, but the correlation evidenced by the figures does not appear to be a close one.

R. T. L.

SISCO (Dwight L.). **Incidence of Hookworm Disease among Persons who were cured Five Years Ago.**—*Jl. Amer. Med. Assoc.* 1923. Feb. 17. Vol. 80. No. 7. pp. 451–454. [2 refs.]

This is an interesting report of a re-survey of hookworm in Antigua, where a campaign for eradication had been carried out in 1915–17 when 29·8 per cent. were proved to be infested. Of 1,234 then freed of infection, 21·2 per cent. were found reinfested. A much smaller number of persons, however, were examined, and the author states: "For all practical purposes infection . . . among the persons who were cured of hookworm disease five years ago may be said to have reverted to the same incidence existing before any treatments were given." The logical inference, therefore, is that sanitation to reduce the possibilities of reinfestation to a minimum should precede treatment, and that sanitary efforts should not be relaxed when the intensive campaign terminates.

R. T. L.

PEYRE (E. L.). **Contribution à la thérapeutique et la prophylaxie de l'ankylostomiase.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 98–100.

Ankylostomiasis is very prevalent in French Guiana. Among the population of St. Laurent 46·6 per cent., and among convicts 71·8–90 per cent., are infested, according to different observers. At Cayenne 75·3 per cent. of 7,669 patients examined were harbouring the hookworm.

As regards treatment, the author thinks that the dangers of oil of chenopodium, and the risks of combining it with castor oil, are unfounded. The best mode of administering it, he finds, is in doses of

4 cc. of the oil of chenopodium with 30 gm. of castor oil on two successive days. This method cured 83·4 per cent., as contrasted with 63 per cent. when smaller doses (3 cc.) on two days, or a larger dose (5 cc.) on one day only, were used.

R. T. L.

RICHARDS (D. C.). **Report on Cases of Ankylostomiasis treated in the District Hospital, Penang, from Aug. 24, 1921, to Dec. 31, 1921.** —*Indian Med. Gaz.* 1922. Dec. Vol. 57. No. 12. pp. 460–461.

The routine treatment adopted was as follows: No food after 4 p.m. on the day preceding administration of the anthelmintic; at 8 p.m., an oz. of magnesium sulphate in water; at 7 a.m. the next day, a single dose of 2 cc. of oil of chenopodium in gelatine capsules, followed at 9 a.m. by another oz. of the sulphate. No food was allowed until the bowels had acted. Any sign of collapse after the oil was met by intramuscular injection of 1·5 cc. of pituitrin. If ova were found in the faeces after the fifth day the treatment was repeated.

Of 102 patients receiving the treatment one died of advanced anaemia and old-standing nephritis; the remainder were discharged as cured, and only ten needed the second course.

R. T. L.

LAMBERT (S. M.). **Carbon Tetrachlorid in the Treatment of Hookworm Disease. Observations in Twenty Thousand Cases.**—*Jl. Amer. Med. Assoc.* 1922. Dec. 16. Vol. 79. No. 25. pp. 2055–2057. [2 refs.]

—— **Carbon Tetrachlorid in the Treatment of Hookworm Disease. Observations on Fifty Thousand Cases.**—*Ibid.* 1923. Feb. 24. Vol. 80. No. 8. pp. 526–528.

Among 20,500 persons treated there were 13,000 Fijians, 6,500 Indians, and 1,000 Europeans. Previous examinations had shown that the infestation rate among the first was 89 per cent., and among the second 93 per cent.; that in Europeans is not stated.

Carbon tetrachloride in a dose of 0·2 cc. for each year of age up to a maximum of 4 cc. was administered in water, fasting. Sulphate of magnesium was usually given three hours later, because it was found that untoward symptoms, such as headache and giddiness, were thus obviated. As a rule, the drug acted as its own purge and caused very little discomfort. Of 823 patients who had undergone a single treatment over 90 per cent. were free more than six months later.

Another 22,000 were treated without ill-effects, but in the final 8,000 an impure form of carbon tetrachloride was used, and three deaths occurred. At the autopsy the liver was found to be extensively degenerated. Other patients showed serious symptoms, but recovered. The drug could be given to pregnant women with less risk of abortion than when oil of chenopodium was used. For heavy ascaris infection the two drugs together prove more efficient than either singly.

R. T. L.

SMILLIE (W. G.) & PESSOA (S. B.). **Treatment of Hookworm Disease with Carbon Tetrachloride.**—*Amer. Jl. Hyg.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 35–45. [12 refs.]

Carbon tetrachloride was given to a large number of patients harbouring *Necator americanus;* 3 cc. was found to be the best dose for adults, and removed over 95 per cent. of worms. It is stated that larger doses than 3 cc. may be dangerous, especially in alcoholic subjects, in whom 1·5 cc. has produced headache, nausea, vertigo and somnolence. To the larger doses reactions are variable, some having received as much as 50 cc. without ill-effects. Two conflicting statements appear in the paper. It is stated (p. 42) " there is as yet no reported fatality from ingestion of the drug," and (p. 45) " A later and more serious manifestation is fatty degeneration of the liver, which first manifests itself two or three days after treatment. This condition rarely occurs and is seldom fatal."

R. T. L.

COOPER (A. T.) & VADALA (A. J.). **The Treatment of Hookworm Disease by Carbon Tetrachloride.**—*Milit. Surgeon.* 1923. Feb. Vol. 52 No. 2. pp. 187–189. [1 ref.]

The authors state that by treating cases of hookworm infection with a single dose (3 cc.) of carbon tetrachloride they have obtained a cure in 100 per cent. It was equally effectual when given after food as when fasting. No mention is made of the number of cases dealt with.

R T. L.

PHIPPEN (Harry G.). **The Treatment of Ankylostomiasis with Beta-Naphthol and Thymol.**—*Brit. Med. Jl.* 1923. Mar. 3. p. 371.

Cases which had been previously treated without success by thymol were found to clear up when this was given with beta-naphthol. The method adopted was as follows : In the evening a purgative of calomel 5 gr. and sodium bicarbonate 10 gr. ; next morning at 7 a.m. sodium sulphate 3 dr. in water. At 8 a.m. 30 gr. each of thymol and beta-naphthol in a mixture, the patients being kept in bed without food or drink till 4 p.m., when they were allowed fluids. They are instructed to report again in a week. The figures given are confusing, but it is claimed that 89 per cent. are cured by four treatments.

R. T. L.

LEACH (C. N.) & HAMPTON (G. G.). **Betanaphthol in the Treatment of Hookworm Disease.**—*Jl. Amer. Med. Assoc.* 1923. Jan. 6. Vol. 80. No. 1. pp. 8–11.

Of 397 prisoners at the Bogambra Prison, Kandy, Ceylon, 93·7 per cent. were found to harbour hookworms. Without any preliminary dieting or purging 50 gr. of betanaphthol in powder were given at 6.30 a.m. before any food ; 31·6 per cent. showed no further ova in their stools. Eight days later 60 gr. were given to 139 of those still positive and, as a result, in 38·1 per cent. the faeces were free of ova. The drug was more effectual on ascaris than on the hookworm. It is interesting to note that no ancylostoma were found ; of 385 worms examined all were necator.

R. T. L.

MILLER (Frederick A.). **Alivio y dominio de la Anemia Tropical en Colombia.** [The Control of Tropical Anaemia in Colombia.]—*Repert. de Med. y Cirug.* 1922. Mar. & Apr. Vol. 13. No. 6 (150) & No. 7 (151). pp. 312–321 ; 346–366.

During the Rockefeller Foundation's Hookworm campaign in Colombia 53,390 persons were examined ; 49,940 (92 per cent.) were found infected, 47,882 were treated with oil of chenopodium, and 37,488, or 78 per cent., of them were freed from the parasite.

Seventy-six per cent. of the total number examined were found harbouring trichuris, and 72 per cent. ascaris. The former of these, unaffected by the anthelmintics usually employed, was readily removed by the latex of the *Ficus glabrata* found in Colombia. Details are given, in the text and in tables, of the numbers treated in each of 23 districts of the country.

H. Harold Scott.

ROCKEFELLER FOUNDATION, INTERNATIONAL HEALTH BOARD. **Bibliography of Hookworm Disease.** Publication No. 11.—417 pp. 1922. New York City.

The Bibliography of hookworm now put at the service of hygienists and scientific workers throughout the world has been in course of compilation since the organization of the International Health Board in 1913. The work contains 5,680 entries, and will prove invaluable to students and research workers in the tropics. A large part of the literature dealt with is controversial, due chiefly to the fact that discussion which has centred mainly around various practical problems connected with the control of the disease has been carried on under a great variety of difficult conditions, and little opportunity has arisen for scientific enquiries to be undertaken to settle the points at issue. There appear from the number of entries recorded for different years to have been four peaks of activity in publication, viz.: in 1882, after the outbreak in the St. Gothard tunnel workers; in 1903, when it was discovered in European mines; in 1910, when Looss's work was reaching its culmination; and in 1917, when American activities in the field were at their height. There is an admirable introduction giving in brief outline the history of the discoveries of the parasites; the origin of faecal diagnosis; the development of treatment with vermifuges; the spread of hookworm to the mines after the St. Gothard tunnel epidemic; Looss's remarkable work which established the fact and importance of dermal infection; and the origin and progress of the campaigns against the infection first in the United States and latterly in other parts of the world. The Bibliography is arranged into subdivisions of subjects, and under each heading the titles are arranged by authors. This, of course, has necessitated frequent repetition of the same title. There is a useful Author and Geography list of cross references, and an alphabetical list of periodicals referred to in the text. The work is printed beautifully and is of handy shape. Necessarily many references appear which are of little or no scientific value, but these have at least an interest to the historian of medicine. There is no definite indication of the date upon which the collection of references ceased, but one perhaps can assume that the period covered extended to 1922.

R. T. L.

ANSCHÜTZ. **Ueber chirurgische Komplikationen bei Trichocephalus-und Oxyurisinfektionen (Invagination bei Trichocephalus- und Oxyuristyphlitis, periproktitische Oxyurisabscesse).**—*Klin. Woch.* 1922. Oct. 28. Vol. 1. No. 44. pp. 2174–2176.

BAUGH (W. P.). **Report of Case of Obstruction to Intestine due to Ascaris.**—*Jl. Amer. Med. Assoc.* 1923. Jan. 20. Vol. 80. No. 3. p. 181.

BAYLIS (H. A.). **Notes on the Collection and Preservation of Parasitic Worms.**—*Parasitology.* 1922. Dec. Vol. 14. No. 3 & 4. pp. 402–412. With 1 plate.

BECHER-RUDENHOF (Frida). **Ein Beitrag zur Behandlung der Oxyuriasis.**—*Wien. Klin. Woch.* 1923. Vol. 36. No. 9. pp. 165–166.

BIRD (Fred D.). **Note on a Form of Pelvic Hydatid Cyst and its Treatment.**—*Med. Jl. Australia.* 1922. Sept. 9. 9th Year. Vol. 2. No. 11. pp. 289–293.

BURGA (Buenaventura). **Algunos factores de la diseminación de la anquilostomiasis en la provincia de Moyobamba.**—*Cronica Méd.* 1923. Mar. Vol. 40. No. 717. pp. 95–97. [1 ref.]

CAWSTON (F. G.). **Snail Parasites. How and Where the Host of Bilharzia and the Fluke carries Dangers.**—*Farmer's Weekly.* 1922. Nov. 8. Vol. 24. No. 609. p. 840.

CONIGLIO (Casimiro). **Un caso di asma da tenia intestinale.**—*Giorn. di Clin. Med.* Parma. 1923. May 20. Vol. 4. No. 7. pp. 266–269.

FREUDENTHAL (F.). **Bemerkenswerter Fall eines** *Ascaris lumbricoides* **in der freien Bauchhöhle.**—*Med. Klinik.* 1923. Apr. 15. Vol. 19. No. 15. pp. 501–502.

HAGE. **Soll und kann eine Verwurmung von Schulkindern bekämpft werden? [Ausgeführt an einem Beispiel aus Thüringen.]**—*Muench. Med. Woch.* 1923. Jan. 19. Vol. 70. No. 3. pp. 85–87; and *Cent. f. Bakt* I. Teil Orig. 1923. Jan. 30. Vol. 89. No. 7–8. pp. 272–285.

KAZAMA (Yoshiaki). **[On a Case of Primary Carcinoma due to** *Schistosomum japonicum,* **which caused Liver Cirrhosis.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1922. Nos. 2294 & 2295. [Summarized in *Japan Med. World.* Tokyo. 1922. Dec. 15. Vol. 2. No. 12. p. 346.]

KAZAMA (Yoshiaki). **[On a Case of Tuberculosis of the Hernial Sac in** *Schistosomiasis japonicum.*]—*Iji Shimbun* (*Med. News*). 1922. Aug. No. 1100. [Summarized in *Japan Med. World.* Tokyo. 1922. Dec. 15. Vol. 2. No. 12. p. 348.]

MILOSLAVICH (Edward L.). **Ascaridiasis hepatis.**—*Wien. Med. Woch.* 1923. Vol. 73. No. 1. pp. 26–31. With 1 fig.

NICOLL (William). **Recent Progress in our Knowledge of Parasitic Worms and their Relation to the Public Health.**—*Parasitology.* 1922. Dec. Vol. 14. No. 3 & 4. pp. 378–401.

NOGUE (M.). **Kystes hydatiques du foie, de la rate et du péritoine chez un noir du Congo.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 144–146.

PELLÉ. **Note sur le traitement chirurgical des kystes hydatiques du poumon.**—*Arch. Méd. et Pharm. Nav.* 1922. July–Aug. Vol. 112. No. 4. pp. 265–274.

TURNER (C.). **I. Hydatid Diseases. Part I. Surgical Cases. Part II. Cases of Hydatid Disease met with** *Post-mortem.*—*Med. & Scientific Arch. of the Adelaide Hospital. Supplement to the Ann. Rep. of the Adelaide Hospital for the Year 1921.* pp. 1–4.

VON WINTERFELD (Hans Karl). **Ein schwerer Fall von Askaridosis.**—*Klin. Woch.* 1923. May 21. Vol. 2. No. 21. pp. 980–981.

MISCELLANEOUS.

SOARES (J.). **Aperçu clinique des "Mycoses."**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 123–128. With 8 figs.

A clinical account of a process of indolent ulceration, observed for the most part in Chinese patients, the mycotic origin of which was consistently verified by cultivation tests on Sabouraud's medium. The early stage of tumefaction and softening is suggestive of syphilitic gumma, but pain is absent, the lymphatic glands are unaffected, and the initial tumour is of a different consistence and is non-adherent. The non-participation of the lymphatic glands and the absence of copious suppuration is distinctive from tubercle.

This unspecified mycosis may be localized in the skin, or may involve muscle and even periosteum, and illustrative cases of all three phases are given. In the skin it begins as a well-defined, non-adherent, painless, non-inflammatory tumour of firm consistence, and tends to terminate as a fistulous ulcer infiltrated with yellow odourless pus ; several such developed in the same patient. In the case, briefly described by the author, where the muscle was involved, an odourless watery fluid containing grumous clots exuded from the fistulae; and in the case where the periosteum was affected there was much grumous pus. The treatment adopted was pot. iod. internally and iodine locally.

A. Alcock.

ACTON (Hugh W.) & CHOPRA (R. N.). **The Production and Pharmacological Action of Khesari Amine.**—*Indian Med. Gaz.* 1922. Nov. Vol. 57. No. 11. pp. 412–415. With 6 figs. [4 refs.]

In a former paper [see this *Bulletin*, Vol. 20, p. 46] Acton indicated that the poison which causes lathyrism is probably a vegetable protein base (amine) produced by enzyme action both before and during germination. This substance was shown to be water-soluble and thus to differ from the poisonous plant alkaloids. Here the authors give an account of the isolation of the amine and of its pharmacological effects on animals. For the method of isolation the paper must be consulted ; the final product was an apparently pure crystalline amine hydrochloride. The result of the tests on animal tissues was to show that the amine has a slightly depressant effect on the excised heart (rabbit) and produces a slight rise of blood-pressure (cat), indicating vaso-constriction elsewhere than in the limbs and kidneys. Large injections were made into a monkey, a guinea-pig, white rats and mice. In most instances there was transitory spasticity of the hind limbs ; the guinea-pig was completely paralysed in these parts for some hours, but had completely recovered three days later. In given samples only half or less than half the grains germinate. The yield of amine from seeds germinated 48 hours was nearly twice as much as that from the non-germinated.

A. G. B.

TORREGROSA (Arturo). **Diagnóstico diferencial de las Pirexias Tropicales más comunmente observadas en Puerto Rico.** [Differential Diagnosis of the Febrile Conditions commonly met with in Porto Rico.]—*Bol. Asoc. Med. de Puerto Rico.* 1920. June. Vol. 14. No. 126; Sept. No. 127; Dec. No. 128; 1921. Feb. Vol. 15. No. 129; Apr. No. 130; June. No. 131; Aug. No. 132; Oct. No. 133; Dec. No. 134; 1922. Vol. 16. Feb. No. 135; pp. 25–57; 67–102; 115–148; 1–21; 46–66; 93–116; 145–170; 197–220; 263–288; 17–43.

This series of papers constitutes almost a treatise on the most frequently encountered diseases of Porto Rico associated with fever, embracing as they do, not only " tropical pyrexias," but also conditions not peculiar to tropical countries, where they are liable to be overlooked. Although due regard is paid to the value of laboratory work, it is rightly spoken of as a help in diagnosis and not a substitute for clinical investigation.

The author's division of his subject into the three main groups of diseases (i) with fever of intermittent type; (ii) with fever of continuous or remittent type; and (iii) those with an irregular type of fever, necessarily involves a certain amount of overlapping and repetition.

In the first group malaria naturally is the chief item, though medical men in the tropics are too prone to regard all such febrile conditions as malaria. (OSLER's statement with respect to abscess of the liver that he had rarely met with a case which had not been drenched with quinine, the author applies very aptly to tuberculosis, which is widespread in Porto Rico.)

The author deals first with the points of difference between malaria, especially of the pulmonary type, and tuberculosis in an early stage.

In differentiating febrile filarial conditions the rise and fall of eosinophiles should, he states, make us suspect filariasis. In malaria, on the other hand, there is a diminution of eosinophiles. When there is a difficulty in arriving at the diagnosis in cases of suspected filariasis the author recommends a process analogous to that of ABL for malaria. Adrenalin or pituitrin is injected with a view to driving the embryos from the capillaries of the lungs and other viscera to the peripheral circulation.

Cases occur which form, as it were, a connecting link between this first group of cyclical intermittent and the second of remittent types of fever, partaking of the characters of both. As examples are mentioned intestinal infections and " visceral sepses."

Passing on to the author's second main group—continuous and remittent fevers—he states in the first place that malaria with more localized manifestations than usual in lungs or liver is often overlooked, and the case regarded as one of pneumonia, hepatitis, angiocholitis, and so on.

In this section the author deals first with continued fever due to malaria of minor degrees of severity, and the differentiation of this from gastro-hepatic infections, enteric (typhoid and paratyphoid), acute endocarditis, generalized tuberculosis, the pneumonias, appendicitis, puerperal fevers and *B. coli* septicaemia; and, secondly, with the " accès pernicieux " of malaria and the diagnosis of these varieties from conditions resembling them.

The question of differentiation between malaria and typhoid occupies several pages. The points of contrast between " classical typhoid " and the disease as seen in the tropics are not as a rule so distinct as given in the author's table. A very interesting description is given of a small outbreak in epidemic form of *B. coli* septicaemia, the diagnosis being made in the first instance by spleen puncture and cultivation.

It seems a pity to continue the employment of the term " Typhomalaria " to indicate the coexistence of malarial and typhoid infection, even if the concession is made of placing it in inverted commas ; still less necessary is it to coin the analogous " Colimalaria."

The discussions on various forms of pernicious malarial fevers (adopting JAMES's definition of the term) are excellent ; particularly instructive is that on the form resembling encephalitis lethargica. In his final remarks upon them he calls attention to methods of examination previously mentioned—by thin and by thick smears, and by the adrenalin method—and also suggests others more difficult of performance [for which the serious state of the patient would hardly allow time], namely, by cultivation of the parasite, and by SWELLENGREBEL's " xeno-diagnostic " method (submitting the patient to punctures by Anopheles and after the lapse of at least four days dissecting the mosquito for oöcysts and pigment granules (!)).

In the last part of this section the author deals with the question of blackwater fever, stating first the various opinions as to its nature. He then discusses the diagnosis between bilious haemoglobinuric fever and yellow fever, Weil's disease, acute yellow atrophy of the liver, and febrile haematurias. Apart from clinical phenomena the discovery of the *Leptospira icterohaemorrhagiae* in the urine of Weil's disease and of leucin and tyrosin in acute yellow atrophy are important features in diagnosis.

The third group—conditions with irregular fever—comprises those with an irregular course of temperature as an integral part of the cycle, not such as exhibit afebrile phases in an ordinary intermittent or continuous course. Thus, he includes undulant fever, influenza, dengue, pappataci fever, " seven day fever," the exanthemata (measles, small-pox, scarlatina, chicken-pox), and helminthiasis. He quotes his own experiences and also those of others (JAMES, LEGRAIN, DELILLE) to demonstrate the irregularity produced by the treatment of malaria with inadequate doses of quinine, thereby causing the temperature to lose its distinctive characters of intermittency and periodicity. This point is particularly directed to those practitioners who, without examining the blood to aid the diagnosis, give quinine in all cases of fever, but, feeling that they are working in the dark, are at the same time afraid to prescribe the drug in sufficient doses and so render the recognition of the parasite still more difficult.

The author's remarks on the various helminthic conditions are all to the point, but from a diagnostic aspect there is nothing special to record, the question being decided on the usual clinical signs and laboratory findings.

The remaining affections in this group do not call for further comment here ; the question of diagnosis being decided largely on clinical grounds, which are dealt with very thoroughly.

As the author himself states, it is a difficult matter to give a résumé of the febrile conditions relegated to this group, for in some the symptomatology is not distinctive (*e.g.*, the " nervous fevers " of hysteria, neurasthenia), in others the temperature may be at times intermittent or continuous, but irregular also (*e.g.*, intestinal parasitic infections, influenza), while yet in others their very rarity is an obstacle to diagnosis (*e.g.*, undulant fever).

A few words in conclusion; the problem which the author set himself, of solving the question of the differential diagnosis of febrile conditions in the tropics, was a difficult one, and could only be undertaken by a physician of wide experience endowed with powers of sound clinical observation. This task Dr. Torregrosa has performed most satisfactorily, and if this series of papers were to be amplified by the inclusion of a few more cases described in detail and temperature charts illustrative of the conditions dealt with, the result would form an excellent text book of Tropical Pyretology.

H. Harold Scott.

ACONCHA (Luis E. S.). **Algunas consideraciones sobre la higiene en Colombia.**—*Repert. de Med. y Cirug.* 1921. Dec. Vol. 13. No. 3. (No. 147.) pp. 141–153; and 1922. Jan. No. 4. (No. 148.) pp. 205–221.

Endemic dysentery, hookworm disease and malaria—and in some parts relapsing fever and *carate* (pinta)—form a serious obstacle to the colonization and exploitation of the rich and extensive territory of Colombia east of the river Magdalena.

The most heavily infected regions are those situated at an altitude of 800 metres or less above sea-level, with a temperature ranging between 30° and 36° C. Lighter infection prevails in subtropical regions at an altitude of 800–1,500 metres, with a temperature of 24°–20° C., hookworm being most frequent, with malaria second. In the more healthy regions lying at an altitude of 2,000 metres, with a temperature not exceeding 24° C., amoebic dysentery and hookworm are most prevalent, and malaria is comparatively benign.

A. G. B.

DE LANGEN (C. B.). **A Medical Geographical Map of the World.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 199–210.

This paper is unusual in that cosmopolitan and not parasitic diseases are discussed, their respective frequency in Java and the West being compared.

Cholelithiasis.—Gallstones are very rare in the Dutch East Indies. Among 422,000 patients in Javan hospitals between 1906 and 1916 this diagnosis was made in 30. In 200 and 242 post-mortems gallstones were found once each. In Europe the deadhouse statistics vary between 7 and 20 per cent., and in Japan this figure is 3 per cent. In Europe, moreover, cholesterine stones predominate; in Java, bilirubin calcium stones. In Japan 65 per cent. of the stones are of the latter variety. European gall contains 3–4 times more cholesterine than Java gall, and the cholesterine blood value for the Javan is only 60 per cent. of that of the European. This difference depends upon the food; with a diet richer in cholesterine the blood value rises. It is inferred that infection is not the principal factor in the formation of gallstones but the richness of the food in lipoids.

Liver cirrhosis.—A well known disease in Java, where alcohol is little used. The author would incriminate "the numerous intestinal disturbances which occur in the tropics."

Ulcer of the stomach.—In Europe and U.S.A. these cases form 1–7 per cent. in middle-aged people. Among the 422,000 hospital patients in Java, gastric ulcer was diagnosed 48 times. In Japan also the disease is rare. Such theories as difference in acidity, traumata, sedentary living, are not accepted by the author, who inclines to the vagotonic theory "in which spasm and changes in the motility of the stomach play the principal rôle," but he does not develop this somewhat nebulous suggestion.

Cancer in the tropics.—In the 422,000 Javan patients referred to there were 460 cases of malignant tumour, or about 1 in 1,000, a low proportion not well accounted for by the shorter span of the native's life. Cancer of the stomach was not seen in 70,000 patients. Primary cancer of the liver was common and usually found with atrophic cirrhosis.

Stone in the bladder and kidney.—Both are common in the Orient, especially those of the bladder, and in boys. The author asks whether this depends on the higher concentration of the urine (900 cc. passed in 24 hours as against 1,500 in Europe) or on the composition of the food. He suggests, too, a study of kidney disease in various races in relation to food.

Diabetes.—This disease is common in the European colonist, and only less so in the Chinese and Arabs in Dutch East Indies, but in the hospital statistics there were only 39 cases. This was also McCay's experience in Calcutta; diabetes was common among the well-to-do, rare among the poor. Is an over supply of fats and proteins the cause in the wealthier people?

The problem of calcium.—In the Dutch East Indies the staple diet, rice, is poor in calcium. So is the drinking water and the vegetation. Horses need a calcium ration. Spasmophilia is very common in Java; in Batavia 17·5 per cent. of children die in convulsions. The remedy is a ration of calcium which, according to the author, is provided in America by a law prescribing that ordinary salt must be mixed with a certain percentage of calcium. In the Dutch East Indies the coagulation time is longer than in Europe. Bleeding after operation is sometimes severe. Haemoptysis is frequent in tuberculosis, so much so that the name for tuberculosis in the vernacular means "coughing with blood." Calcium deficit must be the cause. Calcification is rare in the autopsies of tuberculous patients, nor is calcification of the first rib cartilage found. Calcification in arteriosclerosis is rare.

Amyloid is never met with in Java, though the conditions which are described as leading to it are very common.

Prostatic hypertrophy.—In the 422,000 patients there were six cases of enlargement of the prostate, a low figure again not entirely explained by the relatively short life of the Javan.

Finally, the author refers to the absence of scarlet fever, and the rarity of locomotor ataxia and general paralysis, and states that among the 422,000 hospital cases only 139 were diagnosed as appendicitis.

A. G. B.

Cleland (J. Burton) & Campbell (A. W.). **The Australian Epidemic of Acute Encephalo-Myelitis: A Consideration of the Lesion.**—Reprinted from *Jl. Nervous & Mental Disease.* 1920. Feb. Vol. 51. No. 2. pp. 137–145.

In two epidemics of a peculiar kind of encephalo-myelitis having a mortality of 70 per cent. a remarkable feature was the infrequency of evidence of paralysis, while a post-mortem phenomenon was distension of the perivenous sheaths, particularly in the corpus striatum and pons and medulla, by lymphocyte-like cells. This local cellular reaction is by the authors regarded as evidence of response to some irritant originating in or from the morbific organism, and the signs and symptoms of the disease are attributed to the mechanical and physiological effects of this cellular proliferation.

The disease was communicated experimentally to a calf, a horse, to monkeys (in which the predominant manifestation was intense inco-ordination), and to sheep. But in a series of sheep, infected in identical circumstances, while some individuals contracted the disease and died, and some were affected but slightly, others were completely indifferent and maintained their insusceptibility under subsequent severer conditions. From this insusceptibility of individual sheep, which the authors would appear to interpret as an impotence of the specific micro-organism to provoke the local perivenous cellular reaction, the authors offer a considerable explanation of the fact that in epidemics of poliomyelitis and encephalomyelitis, few individuals contract the disease, although so many (at any rate in the former disease) appear to harbour the specific micro-organism.

A. A.

THOMSON (J. W.). **Notes on Cases of Deep Abscesses.**—*Nigeria Ann. Med. & San. Rep. for the Period 1919–1921.* pp. 47–48.

In a single year J. W. Thomson has had to treat 13 cases of "deep abscess" (pyomyositis), six of which were fatal cases. The pus in one case was sent to the laboratory at Lagos, and was reported by CONNAL to give a pure culture of staphylococcus. One case seemed to improve under a mixed antistaphylococcus vaccine; another did not. Potassium iodide had no effect, nor had antistaphylococcus serum. In a few cases evacuation of the abscess cavity and sewing it up after swabbing with iodine was a complete success, but usually the cavity has to be drained. In one case there was a succession of 20 abscesses. The fatal cases terminate in exhaustion, or septicaemia, or some intervening infection such as pneumonia.

A. A.

KEANE (G. J.). **Annual Report on Venereal Disease Measures, Uganda, for 1921. (Appendix No. III.)**—*Uganda Protectorate Annual Medical and Sanitary Report for the Year ended 31st December, 1921.* pp. 59–73.

Dr. WEBB reports that of 790 cases of primary and secondary syphilis attending Mulago Venereal Hospital 279, or 37 per cent., defaulted after an average attendance of seven weeks, 37 were discharged after an average of nine and a half weeks and 6 had died. The 468 still attending did so for an average of 12–15 weeks; it is not possible to get patients to come for longer periods. The routine treatment consisted of ¼ or ⅙ gr. of metallic mercury intramuscularly or 4 minims of calomel cream intramuscularly, or ⅐ gr. of mercury cyanide intravenously, in each instance weekly. (The Baganda do not tolerate mercury except in doses ⅙–¼ of those given to Europeans.) Salvarsan and its substitutes usually were issued only on payment. At the end of a three months' course the patient would have had 3 gr. of Hg or 2 of HgCN and 0·3–0·6 gm. of salvarsan.

After a preliminary comparative trial had shown that the Sachs-Georgi reaction gives readings 10–19 per cent. lower than the Wassermann in all cases of syphilis, the majority of serums were tested by the former reaction. As a result of over 2,000 tests by one or other method it was shown that an average of 12·4 weeks' treatment caused a drop of 21–30 per cent. in the number of positive serums, followed by a definite rise in the percentage two months later. The clinical results were no better. After an average attendance of four weeks 212 out of 321 patients retained active signs of the disease; 38 per cent. showed active signs after eight weeks' rest from treatment. "It may be reasonably inferred that between 60 and 70 per cent. remain infective after completing a course." It is necessary therefore to push the arsenical, and it is suggested that 2 gm. arsphenamine should be given over a course of 12 weeks, at a cost of about 18*s*. per head.

Keane points out that these observations refer only to a section of the work, and that the results in conditions other than primary and secondary syphilis seem quite satisfactory. He thinks the percentage of defaulters will compare favourably with those in European clinics. He comments on the high prevalence, 30 per cent., of stricture of the urethra in males, the result of gonorrhoea.

Arsphenamine was given in small dose because both the supply and money to purchase it were scarce, and authority for its issue without payment had not been obtained. Brilliant results were obtained in the treatment of congenital syphilis with sulfarsenol in young and especially new-born infants. As to the prevalence of venereal disease he assesses recently acquired and acute contagious cases at 10–20 per cent. of the population.

In his conclusions he envisages the probability of an attendance of 200 in-patients and 100,000 out-patients annually; the success of the work militates against its maintenance. Natives who have money are willing to pay for treatment. Development of the work should proceed along the lines of combination with general native medical work rather than by separation, for both financial and other reasons.

The report contains much that is of value and interest to medical officers responsible for an anti-venereal campaign in a primitive country.

A. G. B.

THIROUX (A.). **Les maladies vénériennes dans les colonies françaises.** —30 pp. With 2 figs. & 1 chart. [36 refs.] 1922. Marseille: Commissariat Général de l'Exposition Coloniale, 5, rue Noailles.

The larger part of this article—a report presented at a Public Health Congress at Marseilles—concerns syphilis, and the author notes that in the tropics, as in Europe, it is impossible to get exact statistics. A comparison between native troops and troops in Europe shows that the disease is much more frequent in the French Colonies than in France or North Africa. It has been suggested that the blacks are relatively immune to syphilis. If so, the author would attribute their immunity to the fact that the adult is almost refractory to malaria, though in Madagascar and Indo-China Thiroux has described grave symptoms from the association of malaria and ankylostomiasis with syphilis [see this *Bulletin*, Vol. 17, p. 238], and FOURNIER has drawn attention to the severity of syphilis in malarial subjects. The author expresses the opinion that syphilis without symptoms, revealed only by the serum test, constitutes the majority of the infections. He goes on to consider syphilis in each colony.

As regards Indo-China, infection is heavier in Cochin-China and Annam than in Cambodia, Tonkin, or Laos. In 1903 one-third of the Annam population were suffering from syphilis (KERMORGANT), and the author says that the proportion is now still larger, and that he himself has seen cases of general paralysis and transverse myelitis. By encouragement of prostitutes to come for treatment, Thiroux claims to have, in three years, considerably reduced the number of recent infections. In Cochin-China, of 14,095 patients, 1,521, or 10 per cent., were recognized as syphilitic and the Wassermann test was not employed ; and maternity hospital figures show that in 1921 in 1,196 confinements there were 95 miscarriages, 90 syphilitic macerated foetuses, and 60 infants with signs of the congenital disease.

In the Antilles syphilis is more to be dreaded than malaria or yellow fever (NOC and others).

At Djibouti little venereal disease is seen among the natives, but the author thinks it common because in 1921 among 500 Europeans, 18 contracted syphilis, 13 soft chancres and 25 gonorrhoea.

In Senegal, of natives treated in the hospital 90 per cent. have old urethritis and almost all are syphilitic. The still-births, which numbered 17 per cent. in 1890–1908, have come down to 12·8 per cent. since the maternity hospital was opened at Dakar ; 42 per cent. of children die before they reach the age of four. The author notes also that the infants of West Africa are strongly affected by malaria, much more than those of Indo-China ; hence the rapid depopulation in Senegal, where more than half the children born since 1890 have disappeared, while Indo-China continues to flourish.

On the Ivory Coast it is estimated that 50 per cent. of the women in the centres are syphilitic. Still-births number 36–55 per cent. (LOUYS). Many children show signs of congenital syphilis.

In Cameroon syphilis is graver than elsewhere in French Africa, but so is malaria among adults. Thiroux notes that ankylostomiasis, too, is common, occurring in 80 per cent. of adults and 63 per cent. of children between two and three. The infantile mortality lies between 42 and 63 per cent., and syphilis is stated to be the chief cause (JULLEMIER).

In the Middle Congo syphilis equals trypanosomiasis as a cause of sterility. A large number of tertiary manifestations are seen, though in the case of the lower limbs their syphilitic origin is often masked by phagedena, due to the fuso-bacillary association.

In the Shari-Chad region JAUREGUIBERRY suggests that there are two clinical varieties of syphilis: one indigenous, the other imported.

Madagascar is the colony which is most gravely visited by venereal diseases, and the one in which information is most exact. Between 1909 and 1920. 39 per cent. of the total population was treated for syphilis. Three cases of tabes were noted, and 182 internments for general paralysis. In 1911 the percentage of syphilitic babies was 28, in 1920, 43·5. As early as 1902 syphilitic pregnant women were treated, with excellent effect on the offspring. It is noted that in Madagascar malaria is severe both in children and adults.

Commenting on the antivenereal dispensaries which exist (or are in process of organization) in Indo-China, Martinique, Senegal and Madagascar, Thiroux questions whether the natives will persist with treatment after the disappearance of symptoms ; but the spread of disease will be checked. He notes the large number of women without symptoms, but with Wassermann positive, and quotes figures from Paris showing that 62 per cent. of pregnant women were unaware that they were infected, and pointing to the great importance of treatment early in the pregnancy, and surveillance of all pregnant women as far as is possible.

The information about gonorrhoea is even less definite. The disease is widespread; in West Africa and Madagascar it is considered obligatory, and the doctor is only consulted for acute and painful symptoms. In West Africa it is believed that gonorrhoea gives the male a special aptitude for procreation. Little is known as to its precise effect on sterility in women.

In his final remarks the author suggests that the infantile mortality among the offspring of syphilitic subjects is largely aggravated by malaria in those countries where the malarial index in children is high, points to the value of treatment by " quinio-bismuth," to the need for asylums for the insane which have been instituted in Indo-China, Madagascar and West Africa, and to the necessity that all European doctors in the tropics be capable of doing a simple Wassermann reaction, for which Hecht's modification is suggested as demanding a minimum of material and manipulation.

[This paper has been summarized at some length owing to the importance of the subject. The data are, however, lacking in precision, and the figures on which some of the most alarming statements are based are not given. It is probable, though it is seldom so stated, that the statistics given for a whole colony really refer to one or more European stations and their immediate vicinity.]

A. G. B.

LEVY (Moise D.). **The Effect of Arsphenamine Treatment on Cardiovascular Syphilis in Negroes.**—*Texas State Jl. Med.* 1923. Vol. 18. Feb. No. 10. pp. 509–512. [15 refs.]

In Texas among the negro population syphilis is rife, and, probably as a result of strenuous dock labour, the cardiovascular system is particularly affected by the disease. The author reviews the therapeutic and experimental history of arsphenamine, and then tabulates the results of treatment of a series of 19 negro syphilitic cardiovascular cases—6 aneurism, 7 aortitis and myocarditis, and 6 aortic insufficiency—with neosalvarsan. Of this series, 6 individuals died, 5 showed no improvement, 1 became worse, and 7 had slight alleviation of symptoms. The author therefore concludes " that arsphenamine is not without considerable danger in luetic cardiovascular infections in negroes, its results so far as cure is concerned being almost nil."

A. A.

i. VAN DER ZIJL (A.). **Over Salvarsandermatitis en Salvarsanicterus.** [On Salvarsan Dermatitis and Salvarsan Icterus.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 5. pp. 589–613. With 1 plate.

ii. HAZEBROEK (F. E. A.). **De intoxikaties van de gekombineerde kwiksalvarsanbehandeling.** [The Intoxications from Combined Mercury-Salvarsan Treatment.]—*Ibid.* pp. 614–628.

iii. HERMANS (E. H.). **Nieuwere inzichten der Luestherapie.** [Recent Views on the Treatment of Syphilis.]—*Ibid.* pp. 629–654.

i. A description is given of the different rashes noted after salvarsan treatment. The early dermatitis is less serious than that appearing later. Sometimes, especially in the latter, there exists jaundice too.

The dermatitis was rarely seen by van der Zijl in Europeans (1 : 1552) in comparison with its frequent occurrence in Malays and Eurasians (31 : 1292). The reason of this difference the author, after excluding other possible factors (unusual toxicity of the drug used, overdosage, influence of nutrition), assumes to be insufficiency of the liver, often probably the latent stage of cirrhosis, a common disease in the Malay race.

ii. Hazebrook also noted the susceptibility of the Malay to salvarsan intoxication. He quotes in detail two cases of salvarsan jaundice.

iii. Pessimistic views of the toxicity of salvarsan, to which drug the author ascribes six deaths he knows of in 1921 in Java. Hermans thinks that salvarsan interferes too much with the natural healing tendency of syphilis, thereby causing more cerebrospinal localization of the disease (Gennerich). He emphasizes the necessity of examination of the cerebrospinal fluid, and recommends intraspinal treatment in syphilis of the nervous system, quoting cases successfully dealt with in this way. The technique is given in detail. The same remark as in the two preceding papers is made about the susceptibility of the natives to salvarsan intoxication.

W. J. Bais.

NOGUE (M.). **Un cas d'insuffisance hépatique avec ictère à la suite d'une série d'injections de novarsénobenzol.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 146–149.

The patient, a West African, who, besides being syphilitic, was addicted to alcohol, received in two months six injections of 914, beginning with 0·15 gm. and increased by 0·15 gm. in regular succession up to 0·90 gm. Subsequently he grew extremely thin and weak and somewhat jaundiced, and suffered from vomiting, diarrhoea and a painful heaviness about the region of the liver, and his urine then was found to be greatly deficient in urea and to contain albumin, excess of insufficiently oxidized nitrogenous products, of scatol, and of biliary pigments, and crystals of leucine and tyrosine. He was put on milk and vegetarian diet, and treated with intravenous injections of cyanide of mercury and small doses of sodium sulphate ; and although his jaundice almost disappeared, he became otherwise worse. Meanwhile, although he had never been fevered, crescents were found in his blood, and he was then put on antimalarial treatment, with the result that he very soon became better and his urine approximately normal.

A. A.

INGRAM (A.) & MACFIE (J. W. S.). **Two Further Cases of Cardiac Aneurysm.**—*Ann. Trop. Med. & Parasit.* 1922. July 20. Vol. 16. No. 2. pp. 119–126. With 1 plate & 2 text figs. [2 refs.]

These cases occurring at Accra, this time in European men of 32 and 36 [see this *Bulletin*, Vol. 17, p. 422], concerned the left auricle and the anterior cusp of the mitral valve. One died on the beach while waiting for the steamer, the other from heart failure in the course of an illness. Neither had been on the West Coast more than about a year, and both had been medically passed as fit for service there.

A. G. B.

LHUERRE (H.) & HUDELET (G.). **Un cas d'anévrisme de l'aorte abdominale.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 149–151.

The patient's account—a West African of 60 years and of much and varied personal experience of venereal disease in his time—was that his troubles began only two months before admission with severe pain in epigastrium and umbilicus and a particular tender spot near the lower angle of the left scapula, and that eight days afterwards a swelling about the size of a hen's egg appeared below the tenth rib. When admitted the left lumbar region and flank adjoining were enormously swollen, and the skin stretched, shiny, oedematous, and hot; the lumbar backbone was displaced to the right, and the spinous processes were extremely painful. Powerful pulsations were felt on deep pressure. The patient died seven days after admission. At autopsy practically the whole left side of the abdomen was occupied by an enormous tumour, the front wall of which was formed by the sheath of the left psoas muscle. The cavity of the tumour contained a vast clot weighing 1,225 gm. Into the cavity the abdominal aorta opened from the left pillar of the diaphragm to the origin of the left renal artery. Five intervertebral disks were completely destroyed, and the bodies of the last two dorsal and first three lumbar vertebrae were hardly 5 mm. thick.

A. A.

FORNARA. **Lésions cardiaques et aortiques chez des nègres.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2-3. pp. 257-260.

Three autopsies on negroes at Boma are related :—

1. A case of lobar pneumonia, with vegetative endocarditis of the aortic valves and syphilitic aortitis.
2. Parietal aneurism of the heart. The section which passes through the left arterial orifice opens up the aneurysmal sac, filled with recent non-stratified fibrinous clot. The communications between aneurysm and ventricle are numerous (at least two), but small. Here the endocardium is dull and whitish. No cicatrix or area of softening seen.
3. Aneurysms of the aortic valves. The aortic sigmoid valves appear normal, but the bases of two of them lead to the aneurysmal sacs filled with fibrinous stratified clot. Death in this instance was due to acute miliary tuberculosis.

A. G. B.

SINDERSON (H. C.). **Variola in Baghdad. Notes regarding the 168 Civilian Cases of Variola admitted to the Civil Isolation Hospital, Baghdad, during the Autumn Epidemic of 1921.**—*Edinburgh Med. Jl.* 1922. July. New Ser. Vol. 29. No. 1. pp. 18-24.

This epidemic began in August, and after 21 weeks' duration came to an abrupt end in December with a fall of atmospheric temperature. In the 17th week there were 30 fresh cases.

Under 10 years of age, 50 males and 89 females were affected.
Over 10 ,, ,, ,, 28 ,, ,, 1 ,, ,, ,,

The sex anomalies are explained by the fact that there was much concealment of cases, which chiefly affected the more highly prized boys, and that adult women were both protected and concealed by the purdah régime. No cases were admitted between the ages of 10 and 18, and it is suggested that at this period the natives have some natural immunity. The mortality percentage over all cases was 25, and varied between 28 for children under 10 and 17 for persons above that age The age period 1-3 gave the highest death-rate. In only 14 of the 139 cases under 10 was there evidence of successful vaccination. An account is given of the clinical types and of the complications.

A. G. B.

BLEYER (Jorge Clarke). **Ueber Auftreten von Variola unter Affen der genera Mycetes und Cebus bei Vordringen einer Pockenepidemie im Urwaldgebiete an den Nebenflüssen des Alto Uruguay in Südbrasilien.** [The Occurrence of Smallpox among Monkeys of the Genera Mycetes and Cebus, resulting from an Epidemic in the Primeval Forest on the Tributaries of the Upper Uruguay River, Brazil.]—*Muench. Med. Woch.* 1922. July 7. Vol. 69. No. 27. pp. 1009–1010. [3 refs.]

The author states that mild smallpox among the natives of the region of the Upper Uruguay River, in Brazil, spread to monkeys of the genera named, whom it killed in large numbers. " Corpses of these species were found under trees. Sick monkeys, as well as the dead, were covered with variola pustules. Cebus monkeys stricken with the disease were seen wringing their hands (*händeringend*)." No more is said of this unusual occurrence, but the author goes on to speculate on the ease of transmission of the disease in a country where the dead are rapidly devoured by beasts and birds of prey, biting insects abound, and even the butterflies are gross feeders.

A. G. B.

i. BALFOUR (Andrew). ii. FRASER (A. Mearns). [Correspondence.] **Permanganate of Potash in Smallpox.**—*Lancet.* 1922. Dec. 2. p. 1193. [11 refs.]; Dec. 16. p. 1303.

i. The author quotes from a paper which he wrote in 1921 [see this *Bulletin*, Vol. 17, p. 248], and adds the gist of three reports from the tropics in favour of permanganate treatment, from C. J. BAKER, of Uganda, from SELWYN-CLARKE's monograph [*l.c.*, Vol. 19, p. 355] and from J. S. DE SOUSA, of Zanzibar. SELWYN-CLARKE says that the beneficial effects were so apparent when the half-saturated solution was applied 2–3 times daily prior to the rupture of the pustules that the method became very popular amongst patients and attendants. DE SOUSA favours the use of a 5 per cent. solution in definitely discrete cases. In confluent cases the patients were placed in a long bath filled with 5 per cent. permanganate at body temperature for 10–15 minutes twice daily. Smell and sloughing were greatly reduced.

A list of 11 references is appended.

ii. The writer states that a similar treatment was adopted by him at Portsmouth in 1902. The patient was immersed in a solution of izal, and was then completely bandaged from head to foot in several layers of sal alembroth bandages. Though some cases were confluent, all recovered and the skin remained clean. It is suggested that smallpox itself comes to an end after the appearance of the papules, and the illness which starts about the eighth day is a sapraemia caused by the infection of the papules from organisms outside. The antiseptic treatment prevents pustulation.

A. G. B.

PARMANAND (M. J.). **Notes on a Case of Bronchomoniliasis.**—*Indian Med. Gaz.* 1922. Nov. Vol. 57. No. 11. pp. 418–419. With 2 figs.

The patient was a Hindu, aged 38, with history of cough, spitting of blood and irregular fever of some nine months' duration. The physique was good. Physical examination revealed small scattered patches of consolidation in both lungs and râles. The sputum, when stained, showed masses of gram-positive fungus filaments but no tubercle bacilli. There was no thrush in the mouth or fauces. The organism was grown on Sabouraud's medium ; the growth consisted, microscopically, of globular yeast-like cells with a few short mycelial filaments. The sugar reactions were those of *Monilia pinoyi*, Cast.

A. G. B.

FARAH (Najib). **Observations on Castellani's Bronchomoniliasis, with Report of a Case with Pneumonic Onset and a Peculiar Clinical Course.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 1. Vol. 26. No. 1. pp. 1–5.

The patient, a refugee from Jaffa, aged 55, was taken ill with bronchial catarrh and haemoptysis in August and died after 2 years and 7 months. Four months after the onset he had an attack of lobar pneumonia of the left base followed by chronic bronchitis and more haemoptysis. Cough and expectoration continued. Irregular fever was the rule. No tubercle bacilli could be found. A diagnosis of chronic fibroid phthisis was made, till May 1918, when the author saw the patient and inclined to the diagnosis of pulmonary mycosis. There were then signs of contraction of the left lung. Repeated examination of the sputa always revealed *Monilia pinoyi*. Intravenous inoculation of a rabbit with a 24-hour culture resulted in its death with generalized moniliasis. Inoculation of guinea-pigs with fresh sputa was negative. The fungus gave positive agglutination and complement deviation tests with the patient's serum (no details given). The left chest became more retracted, the left arm paralysed, and the patient died in angina. There was no autopsy.

The author recommends the use of injectable iodine in the form of lipiodol containing 40 per cent. iodine in poppy oil. Mild cases recover and the more severe are greatly benefited.

A. G. B.

i. CASTELLANI (Aldo), DOUGLAS (Mackenzie) & THOMSON (T.). **Acute and Subacute Tonsillomycoses.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.) 1922. Aug. Vol. 15. No. 10. pp. 39–44.

ii. ——, —— & ——. **Further Observations on Tonsillomycoses.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 15. Vol. 26. No. 2. pp. 19–24. With 10 text figs. [4 refs.]

i. Acute and subacute affections of the tonsils, of mycotic origin, are frequently met with in the tropics, and are not at all rare in Europe. The fungi responsible are Monilia usually, but occasionally Oidium and Hemispora. Acute cases may simulate diphtheria and are sometimes treated as such.

ii. There are here described, with illustrative cases, various fungous affections of the throat and, with a plate of illustrations, some of the fungi responsible for them. The numerous varieties of acute and subacute tonsillitis due to Monilia, Oidium, Saccharomyces, etc., do not seem to be very serious, but are alarming by being often mistaken for diphtheria. Granular mycosis of the crypts, due to a miscellany of organisms, though not physically painful or alarming, often makes the breath distressingly foul, and thus may be the cause of great mental suffering, as when, in the case recorded here, it leads a husband to look coldly on his wife.

A. A.

HAMILTON-BROWNE (E.). **Case of Actinomycosis of the Breast.**—*Jl. Assoc. Med. Women in India.* 1923. Feb. Vol. 11. No. 1. pp. 18–19.

Case of 15 years' duration, which in its early stage had been surgically attacked as a conjectured cancer, but had been getting worse ever since the operation. The whole right breast was hard and immovably adherent, exuding thin pus from numerous fistulae. The breast and the pectoral muscles were removed right down to the ribs. Typical fungi were isolated from the pus and were found in sections of the tissues removed.

A. A.

i. FONTOYNONT (M.) & SALVAT (P.). **Sur une Actinomycose du rat à Madagascar.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 596–607. With 1 text fig.

ii. LANGERON (Maurice). *Actinomyces Salvati*, **n. sp., nouveau Microsiphoné malgache.**—*Ibid.* pp. 526–528. [5 refs.]

i. The rat was the subject of ulceration or abscess of the tail, testicles, peritoneum and mesentery, pleura, pericardium and eye. The parasite is described with figures ; it proved to be a new species of Actinomyces. The cultures and the results of inoculations into other animals are described.

ii. The author says that he has adopted the generic name, *Actinomyces*, owing to the decision reached in 1920 by the Committee of American Bacteriologists based on the work of BREED and CONN, who showed that the terms *Actinomyce* Meyen 1828, and *Actinomyces* Harz., 1877, are not synonymous [see this *Bulletin*, Vol. 16, p. 197]. *Actinomyces salvati* comes in the section *parasitica* of CHALMERS and CHRISTOPHERSON, subsection *majora*.

A. G. B.

i. BLANCHARD (M.) & LEFROU (G.). **Présence dans une lésion humaine d'un saccharomycète pathogène pour le cobaye.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 915–918. [3 refs.]

ii. MARCHOUX (E.). **Mycose pulmonaire.**—*Ibid.* pp. 919–920.

i. The author found in the pus from a deep abscess over the scapula in a European at Brazzaville a saccharomycete which, inoculated into a guinea-pig, invaded the lymphatic system, causing progressive cachexia and death six months later. No tubercle bacilli could be discovered in the animal, but the yeast was found in various groups of lymphatic glands ; the viscera were quite healthy. The organisms found in the serosanguinolent pus, drawn by puncture from the abscess on six occasions, are described ; there was no mycelium. Attempts at culture failed. Treatment of the patient by potassium iodide was ineffective. The authors admit the uncertainty that this yeast is pathogenic for man.

ii. On February 5 an official from French West Africa consulted the author, complaining of loss of strength and of the passage of red-currant-jelly sputa for two months, suggesting amoebic abscess. Auscultation discovered a cavity in the right chest, which was compatible with the hypothesis of hepatic abscess opened into the lung. No amoebae were found in the sputa, but abundance of yeast cells, many budding. Attempts at culture failed. The patient was lost to view and died in April. A guinea-pig, inoculated on February 5, died on the 13th, showing a lardaceous plaque at the site and a large gland, in both of which the yeast was found. Inoculation was made into a second guinea-pig, which developed a tumour, also containing the yeast cells. These resemble those found by BLANCHARD and LEFROU. The author suggests that the cells are those of a Monilia. In any case, he says, these two reports show that in West Africa one must expect to find at least one form of mycosis resistant to iodide treatment, and probably a moniliasis.

A. G. B.

i. FONTOYNONT (M.) & CAROUGEAU. **Abcés sous-dermique et gommes ulcérées produits par le** *Sporotrichum Carougeaui* **Langeron 1913, associé à la tuberculose chez un enfant malgache.**—*Bull. Soc. Path. Exot.* 1922. June 14. Vol. 15. No. 6. pp. 444–453. [3 refs.]

ii. LANGERON (Maurice). **Un nouveau Sporotrichum malgache :** *Sporotrichum Carougeaui* **Langeron, 1913, et remarques sur les Sporotrichés.**—*Ibid.* pp. 453–459. With 2 text figs. [3 refs.]

i. The authors note that parasites living in nature in the state of saprophytes find a favourable terrain in organs depressed by malaria, tuberculosis and syphilis, and especially in the tropics in the usual conditions of heat and humidity. They think that all the tropical saprophytic fungi may at any moment become pathogenic. The lesions described in his paper were seen in a child of six in Madagascar and were caused by a Sporotrichum. At the time of writing (1911, publication having been delayed till 1922) this was the third case of human sporotrichosis. There were abscesses and ulcerated gummas in the neck and axillae, and a history of two years. The lesions, of which a detailed description is given, consisted of cicatrices, crusted ulcerations and swollen glands. In France the diagnosis would have been tuberculosis, but this disease is rare on the Madagascan plateaux. Inoculations were made on maltose agar and to guinea-pigs. On the media a fungus grew in pure culture ; the animals died of tuberculosis. The authors satisfied themselves of the pathogenicity of the fungus by an agglutination test with the patient's blood.

The cultures on various media are described and the morphology of the fungus. All its characters place it in the Sporotrichum group. It resembles *S. beurmanni*, but is clearly differentiated by the constant absence of pigmentation and the persistance of the white tint. The patient was treated with pot. iod. for over a year and at last recovered.

ii. Langeron discusses the Sporotrichum group, reaching the conclusion that the pathogenic species thus designated should be assigned to the genus *Rhinocladium*, SACCARDO and MARCHAL, 1885. The fungus here described is the first pathogenic Sporotrichum. It is distinguished by its white colour, which persists in the oldest culture. Incidentally the author remarks that the importance of the macroscopic aspect of fungus cultures has been much exaggerated ; the employment of this criterion to the exclusion of morphology has led to many errors, *e.g.* in the genus *Monilia*.

The new Sporotrichum is figured in its mycelial and yeast forms.

A. G. B.

FORGUES (M.). **Les ictères infectieux chez les noirs.**—*Bull. Soc. Path. Exot.* 1922. May 10. Vol. 15. No. 5. pp. 348–350.

Stationed at a military hospital in Tunis, the author has observed since August, 1920, that any sudden changes in temperature are accompanied by a number of admissions to hospital of cases of fever, usually of a mild type, accompanied by jaundice. In most cases the temperature falls in a few days and no recurrence takes place, but twice a definite relapse has been noted. No organism has been discovered which will account for the disease. It is suggested that the sudden changes in the climate may be responsible for an otherwise innocuous organism like *Bacterium coli communis* taking on pathogenic properties and affecting the liver.

C. M. Wenyon.

DE CASTRO (A. Bayley). **Toxic Jaundice of Unknown Origin in the Andamans.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 292–295. With 3 charts.

The author has had five cases of toxic jaundice under his care in two months, and refers to a previous case [see this *Bulletin*, Vol. 17, p. 418]. Notes of three—one fatal—are here given. The salient features are: slight initial fever, increased pulse-rate, very acute pain in the thighs, intense jaundice, hiccough, haemorrhages (from bowel, stomach and nose in the fatal case), early albuminuria, and eosinophilia. No malarial parasites were found and " no *Spirochaeta ictero-haemorrhagica* in any of the several smears of blood examined."

[A fatal form of jaundice in the Andamans was described by WOOLLEY in 1913 (see this *Bulletin*, Vol. 2, p. 323).]

A. G. B.

WHITEHEAD (W. T.). **Report on an Epidemic of Jaundice at Port Sudan.**—*Jl. Roy. Army Med. Corps.* 1922. Oct. Vol. 39. No. 4. pp. 294–298.

Forty-seven mild cases of obstructive jaundice occurred in young adult natives in January–March, 1922; for the preceding 16 years there was no record of jaundice in Port Sudan. Rats and flies abounded; there were no mosquitoes. Eight of the cases are tabulated. The symptoms were epigastric pain, leucopenia (3,000 leucocytes per cmm.), jaundice, clay-coloured stools, slight fever; no albuminuria. The average stay in hospital was four days. Guinea-pigs inoculated with the urine remained healthy. The serum did not agglutinate any of the enterica group, and no organism could be cultivated from the blood.

A. G. B.

DE MELLO (Froilano), DE SOUSA (Jacinto) & GUIMARAES (Affonso). **Some Researches on Rickettsias and the Aetiology of Typhus Fever.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 15. Vol. 26. No. 2. pp. 24–27.

In the blood of 18 typhus fever patients and also of some typhus convalescents in Oporto the authors have found Rickettsia, which they identify with *R. prowazeki*. In the intestine of lice (*P. corporis*) from typhus patients and from beggars, and lice (*P. corporis* and *Ph. pubis*) from inhabitants of a town free from any record of typhus, Rickettsia were to be found, though the authors could not decide whether they were *R. prowazeki*, *R. pubis*, or some other species.

A. A.

SEGAL (M.). **Recherche sur la pathogénie du typhus exanthématique.** —*Rev. Méd. et Hyg. Trop.* 1923. Jan.–Feb. Vol. 15. No. 1. pp. 27–29.

In the course of culture experiments with the blood and brain of guinea-pigs infected with typhus the author has isolated a fungus which, when inoculated into the guinea-pig, produces a febrile malady at all points similar to typhus, and showing analogous lesions and perivascular infiltrations. The fungus, which has been recovered from cultures of the blood and organs of animals experimentally infected with it, is called by the author *Pacillomyces varioti.*

Other fungi may cause fever when inoculated into the guinea-pig, but in such cases the fever has an incubation period of but two days and vascular lesions do not occur.

A. A.

BARYKIN (W.) & KRITSCH (N.). **Microbion typhi exanthematici. (Der Fleckfiebererreger.)**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. March. Vol. 27. No. 2. pp. 49–64. With 1 plate and 2 text figs. [21 refs.]

The authors seem to be imperfectly acquainted with recent English and American work on the secrets of typhus fever. The pith of their prolix paper is a somewhat indistinct account of the process of cultivating "Mikrobion typhi exanthematici"—an organism which they regard as almost certainly the cause of typhus fever, differing from all other microbes found in association with the disease, "with the possible exception of *Rickettsia prowazeki.*" Indeed, except that it is amenable to cultivation, it agrees in all particulars with that Rickettsia.

The "mikrobion" can be cultivated from tissues of typhus patients post-mortem or of experimentally infected guinea-pigs in the fever stage; in the former case there is at first a good deal of concurrent bacterial growth, which, however, does not eventually obstruct the "mikrobion"; in the latter case an almost pure culture results. The process of culture is as follows: Brain, spinal cord, or spleen "sterilized of cadaveric matter" immediately after death is mashed into a broth with tissue of corresponding healthy organs—which tissue has been digested with pancreatin and sterilized for 1½ hours at 100° (presumably C.); the amount of healthy tissue liquor should be from half to one-third of the whole mixture. [We can but assume that the source of the corresponding healthy organs is always the guinea-pig.] Or instead of this digested and sterilized liquor, ascites fluid, or Locke's or Ringer's solution, or a local mineral water which is "a mixture of sundry physiological salt solutions," may be used.

The mixture is cultivated under anaerobic conditions at 35° to 37° C. and growth begins in 10–20 days.

The culture is infective to guinea-pigs, and the effects and the pathological lesions are similar to those seen in guinea-pigs experimentally infected with typhus in the usual way.

A. A.

CROS (L.) & FRÉCUS (F.). **Le typhus dans la division d'Oran. Etude de la morbidité et de la mortalité de 1917 à 1921.**—*Arch. Méd. et Pharm. Milit.* 1922. July. Vol. 77. No. 1. pp. 43–46.

The contents of this paper are summed up in five graphs, which show, *inter alia,* that the morbidity from typhus in the military hospitals in the Oran Division of Algeria has risen from 18 cases in 1917 to 395 in 1921, with a simultaneous increase in the mortality-rate; that the main incidence of the disease is from February to July, the top of the curve being in April and the bottom in October; that in Oran Military Hospital alone the mortality has fallen from 36 per cent. (22 cases) in 1919 to 3 per cent. (26 cases) in 1921, which may be attributable to the treatment practised; that the morbidity curve in the civil hospitals during the same period resembles the military in having its acme in April.

The authors note that typhus is present all the year round, that far from being a winter disease it is favoured by warmth, and its appearance or reappearance must be expected in the first days of spring; moreover, that the mortality exceeds 20 per cent., and is usually smaller in natives than in Europeans.

The Oran Military Hospital treatment consisted in feeding the patients freely as early as possible, and giving them up to 3 litres of hot coffee daily, with injections of eucalyptol, creosote and guaiacol in oil, and in administration of digitalin and strychnine as cardiac tonics.

A. G. B.

QUIROGA (Ruperto). **Campaña contra el tifus exantematico.** [An Anti-typhus Campaign.]—*An. del Depart. Nac. Hig.* Buenos Aires. 1922. Mar. & Apr. Vol. 28. No. 2. pp. 83–121. With 24 text figs., 2 sketch maps & 10 charts.

An account of an outbreak of typhus fever at Mulquín in the Department of Pomán, Province of Catamarca. The origin of the epidemic could not be traced. There were 40 cases in all. Twenty-six were treated in their homes and of these six died; the remaining 14 were treated in a temporary hospital and all of them recovered. The Weil-Felix reaction was positive up to 1 in 500 in 49 out of 54 cases examined. [No attempt is made to account for the non-agreement of the two statements as regards the number of cases.]

The means employed for dealing with the outbreak were: (1) The establishment of a military cordon; (2) notification of all suspects; (3) isolation of all cases; (4) disinfection of huts; (5) disinfection of persons and clothes; (6) provision of fresh clothes and of food for the poor; (7) instruction by pamphlets, etc.

H. Harold Scott.

BRUNET. **Trois moyens simples de préservation contre le typhus.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 101–105.

The three simple means of protection against typhus, or, rather, against the ruthless louse, are the constant daily use of a soap containing 2 per cent. of oxycyanide of mercury, or of a soap consisting of 25 per cent. petroleum, or of a lotion composed of 100 gm., each of 1 in 10 turpentined oil, 1 in 10 camphorated oil and ordinary vinegar and 200 gm. of petroleum.

A. A.

SIKORA (H.). **Beitrag zur Kenntnis der** *Rickettsia prowazeki*.—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Jan. 30. Vol. 89. No. 7–8. pp. 271–272.

The conclusions of this contribution are that in contradistinction from all other species of Rickettsia, *R. prowazeki* lives and multiplies in the cells of the coelom; and that it remains alive in air-dried louse-excrement for 3–24 hours.

A. A.

i. DE MELLO (Froilano) & GUIMARAIS (Afonso). **Constatation dans le sang des exanthématiques de nombreux micro-organismes ressemblant à des** *Rickettsia prowazeki*.—*C.R. Soc. Biol.* 1922. July 22. Vol. 87. No. 27. pp. 707–709.

ii. DE SOUSA (Jacinto). **Présence de** *Rickettsia prowazeki* **dans le sang des convalescents de typhus exanthématique.**—*Ibid.* pp. 710–711.

iii. GUIMARAIS (Afonso). **Flore microbienne du** *Phthirius inguinalis*; **remarque sur des éléments de nature rickettsienne.**—*Ibid.* pp. 711–713.

i. Description of the polymorphic irregularities of an organism identified as *Rickettsia prowazeki* found copiously in the blood of some typhus fever patients.

ii. In the blood of six typhus convalescents (75 per cent. of the number of patients examined) *Rickettsia prowazeki* was found during the two days (two cases), or three days (three cases), or seven days (one case), following subsidence of fever.

iii. In the intestinal flora of crab-lice (*Phthirius inguinalis*) from a part of Northern Portugal free from typhus, the author found typical Rickettsia.

A. A.

DE CASTRO (A. Bayley). **Epidemic of Cases of Oedema amongst West African Porters.**—*Indian Med. Gaz.* 1918. Oct. Vol. 53. pp. 369–372. [Received June, 1923.]

This epidemic occurred among West African carriers in the East African campaign at a camp near the river Rovuma, which divides Portuguese East from what was German East Africa. It followed a march of 400 miles and of many hardships, including " irregular hours for meals, which at times were not properly cooked." The symptoms were : oedema of face and legs, ascites (in some cases), anaemia, slow pulse, hyperidrosis, anaesthetic and hyperaesthetic patches on legs, enlarged or tender liver, but without jaundice ; the reflexes were in half exaggerated, in half normal. Rapid improvement followed treatment in the hospital " banda " by rest in bed and " Ideal " milk, and the patients were discharged to duty in a week or less. Some had thymol, iron and arsenic, which accelerated the cure. Details of three cases thus treated are given. Out-patients improved but slowly. Ankylostomes were sought and found in a few cases only, but in nearly all the stools larvae of *Calliphora vomitoria* were seen and large quantities of particles of undigested chillies, the ration of which, it is noted, was needlessly large. The general ration consisted of beans, rice, meat, tea, sugar, salt and chillies [quantities not stated]. The meat issued was sometimes " bully " ; biscuits might be substituted for rice, fermentation in which often led to its condemnation ; the beans were not always good. The porters affected were of a " low type." No cases occurred among the fighting troops [? West Africans]. On shifting camp the epidemic ceased. The number affected is not stated, nor do we know how long the West Africans had left their own country or the diet to which they were accustomed. [Other epidemic occurrences of oedema are noted in this *Bulletin*, Vol. 17, p. 422 ; Vol. 18, p. 300.]

A. G. B.

SALM (A. J.). **Edema-Disease as Occurring in the Province of Kediri [Java].**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië*, 1922. Pt. 4. pp. 294–303. With 1 plate.

The oedema here described appears to be a sort of famine dropsy, since it is manifested in ill-nourished individuals, and, in this particular outbreak, was first reported, and was most rife, in a district where there was scarcity of food. Persons of all ages are affected, the oedema may spread over the whole body, liver and spleen are not enlarged, there are no cardiac anomalies, the urine only occasionally contains traces of albumin, and paralysis never occurs ; the disease is very frequently fatal, and death is not preceded by any obvious disturbances, except, sometimes, diarrhoea—the sick person quietly snuffs out. From the clinical symptoms, as well as from observations and purposive experimental treatment, nephritis, ankylostomiasis, beriberi, malaria, dysentery, etc., are excluded from the aetiology of this "oedema-disease."

A. A.

ACTON (Hugh W.). **The Causation of Epidemic Dropsy.**—*Indian Med. Gaz.* 1922. Sept. Vol. 57. No. 9. pp. 331–333.

A "preliminary" paper in which the author attributes epidemic dropsy to the use of "seasoned rice." He uses the data collected in 1911 by Colonel E. D. GREIG in Bengal, who showed that the disease affects the Bengali Hindu community with fixed incomes, who live mainly on rice, and not the Europeans or the Marwaris, who eat bread and pulses as well, and that the incidence is particularly high among Bengali widows, to whom caste restrictions forbid meat ; but he parts company from GREIG in his opinion that the disease is due to a one-sided diet. The poorer classes, who escape, eat the new indigenous, and cheaper, rice ; the middle classes, who suffer, eat the old well-seasoned, and more expensive, rice. The disease is most prevalent in September and onwards, when the rice has been subjected to the heat and moisture of the monsoon months ; the vegetable proteids are split up by bacterial or enzyme action into the more soluble digestive proteids, proteoses and peptones, and lastly to amines. High prices influence epidemic prevalence by leading to the hoarding of the rice in godowns.

It is pleasant to read that this research was made possible by the generosity of F. M. KANGA, Esq., of Bombay, where the disease does not occur.

A. G. B.

FRANCIS (Edward) & others. **Tularaemia Francis 1921. A New Disease of Man.**—*Hyg. Lab. Bull.* Washington. Bull. No. 130. 1922. Mar. 87 pp.

Tularaemia is a specific infectious disease due to *Bacterium tularense*, and is transmitted from rodents to man by the bite of a blood-sucking insect, or by manipulating infected rodents in the market or laboratory. The etiology and the phenomena of the disease have already been considered in this *Bulletin* [Vol. 19, pp. 442–444], and a brief abstract of the present review and summary of previous investigations is all that is now necessary.

Cases of tularaemia have been known to occur in Utah among the rural population during the summer months since 1917 ; the first fatal case was reported in 1919. The disease also affects jack-rabbits and ground-squirrels in Utah.

Experimentally the disease can be transmitted by the Tabanid fly, *Chrysops discalis*, and the rabbit louse, *Haemodipsus ventricosus*, and these two insects are probably the usual agents of transmission in nature to man and jack-rabbit respectively. It can also be transmitted to white mice bitten by or fed on infected bed-bugs ; the fresh and stale faeces of the bed-bug are also virulent and are infective when injected. The mouse louse, *Polyplax serratus*, and the Gamasid mite, *Liponyssus isabellinus*, can also transmit the infection.

The specific bacterium can be cultivated on coagulated yolk of egg ; on serum glucose agar, glucose blood agar, blood agar, and plain agar plus a piece of rabbit spleen ; on cystine agar, and on Loeffler's blood serum coagulated at 70° C.

All the laboratory people who have handled infected rodents have contracted the disease.

A. A.

LEDINGHAM (J. C. G.). **Some Observations on Tularaemia.**—*Jl. Path. & Bact.* 1923. Jan. Vol. 26. No. 1. pp. 132–133.

A brief account of Lister Institute experiences of culture of *Bacterium tularense* received from Washington. As in Washington, the study of the organism proved more intimate than was desired, three of the investigators becoming infected and tediously incapacitated. During passage experiments it was observed that spleen films from guinea-pigs dead of tularaemia did not, as a rule, disclose the organism, although the characteristic gross changes in the spleen were evident. In mice, however, although gross changes in the spleen were not conspicuous, spleen films contained the organism in great abundance. The same phenomena were observed in the liver of these animals—in the guinea-pig the organisms could not be detected in the necrotic foci, in the mouse large numbers of individual liver cells were stuffed with them. By fractional centrifugation of emulsion of liver and spleen of infected mice a homogeneous suspension of the organism was obtained for serological study ; patients' sera agglutinated the organism in dilutions up to 1 in 800, the control sera having no such effect in dilutions of 1 in 10.

A. A.

STEPHENS (Horace E. R.). **Climatic Bubo.**—*Jl. Roy. Nav. Med. Service.* 1922. Oct. Vol. 8. No. 4. pp. 263–265.

During a year in the Far East (Wei-Hai-Wei) the author has noted the frequency of occurrence of acute and subacute adenitis in all regions of the body, and he here analyses 177 cases seen chiefly in civilian hospitals [no details of race or sex] ; 130 of these are described as a "heterogeneous collection of non-venereal buboes." The inguinal glands were affected 116 times, the crural 35, the axillary 12, the cervical in 7, and the author's thesis is that not a single case came under his observation where the point of entry of the micro-organism through the skin could not be identified—patches of dermatitis, mosquito bites, "toe-rot," and the like. The author explains the frequency of this type of inflammation by the fact that in hot damp weather the superficial layers of the skin become softened and rubbed off, leaving an easy entry for micro-organisms. [Granted that the definition of climatic bubo lacks precision, it seems probable that this paper should have been entitled Acute and Subacute Lymphadenitis in a Warm Climate.]

A. G. B.

MAGLIULO (Alfonso). **Note cliniche su 44 casi di bubbone climatico.** *Giorn. Med. Milit.* 1923. Apr. 1. Vol. 71. No. 4. pp. 159–174. [31 refs.]

Short descriptions are given of the 44 cases ; smears were made from punctures of the glands and cultures were attempted in several instances, with varied results. The author discusses the question of etiology, and concludes that the condition is not venereal in origin, but is due to local irritation aggravated by perspiration.

H. Harold Scott.

HOFFMANN (W. H.). **Linfogranulomatosis venérea y Bubón Climático.** [Venereal Lymphogranuloma and Climatic Bubo.]—Reprinted from *Rev. Méd. de Hamburgo.* 1922. Vol. 3. No. 11. pp. 323–324.

A brief but instructive paper, drawing attention to the points of similarity and of contrast between venereal conditions and the so-called "climatic bubo." Although a venereal history is not obtained in every case, the author is inclined to regard the latter as a " fifth venereal affection," the other four, of course, being hard chancre, soft chancre, gonorrhoea, and granuloma venereum.

H. Harold Scott.

SHAND (J.). **Climatic Bubo and a Few Experiences in China.**—*Jl. Roy. Nav. Med. Serv.* 1923. Jan. Vol. 9. No. 1. pp. 68–69.

The author from past China experience gives the following list of diseases cured in his practice by santonin only—and caused, in his opinion, by the round worm—chronic diarrhoea, colitis, dysentery, intestinal obstruction, appendicitis, gallstones, intestinal ulceration ; chronic bronchial catarrh, asthma, chronic pleural effusion ; neuritis and neuralgia ; enlarged glands ; splenic anaemia ; chronic abscesses. [Climatic bubo was merely the word which called up the reminiscences set down.]

A. G. B.

GOMEZ (Liborio), NAVARRO (Regino) & KAPAUAN (Amando M.). **The Schick Reaction in Filipinos.**—*Philippine Jl. Sci.* 1922. Mar. Vol. 20. No. 3. pp. 323-330. With 4 plates. [12 refs.]

The Schick reaction is used for determining the presence of immunity, either natural or acquired, to diphtheria toxin.

Mention has been made of the comparative infrequency of diphtheria in the Philippine Islands, in spite of the existence there of virulent diphtheria bacilli, and the Schick reaction was tested on Filipinos of all ages from six months upwards in order to investigate the cause of this low incidence of the disease.

The diphtheria toxin used in the tests was three years old. Altogether 1,030 individuals were tested (698 m. and 332 f.) : 88, or 8·5 per cent., were positive, that is, were presumably susceptible to the disease ; and most of these 88 were children in the first eight years of life. It is therefore concluded that young Filipino children are just as susceptible as children elsewhere, but that boys and girls of school age and adults are very much less susceptible.

A. A.

i. SERGENT (Edm.), BÉGUET (M.), PARROT (L.), LEMAIRE (G.) & VÉRITÉ (H.). **Réaction de Schick et recherche des porteurs de germes dans une épidémie scolaire de diphtérie.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. pp. 349–354. [1 ref.]

ii. CIAVALDINI (Jean). **La réaction de Schick en milieu algérien.**—*Ibid.* pp. 355–357.

i. On the occasion of a small epidemic of diphtheria amongst the pupils of two primary schools in Algiers, of 101 children from 6–15 examined 9 were found to be carriers and 29 to have a positive Schick reaction, testifying to their susceptibility to diphtheria infection. In four instances the same subject was a carrier and susceptible. The Schick reaction was unequivocal from the third day onwards. The authors describe the positive reaction, pseudo-reactions, which are nearly always transitory, and paradoxal reactions, in which heated toxin provokes a stronger reaction than the unheated.

ii. A similar investigation in a small epidemic in Constantine. Of 45 children between 6–14 (11 European, 34 native) 19 gave positive Schick reactions. The percentage of susceptible European children was twice as great as that of the natives, which, the author writes, tends to confirm the current notion of the general immunity of the natives to diphtheria. The true reaction persisted for three weeks, and was attended by pigmentation and scaling. The pseudo-reaction appears promptly, disappears about the third day and does not give rise to scaling or pigmentation. Two carriers, brothers, were detected among the European children.

A. G. B.

SUMNER (F. W.). **Diphtheria Carriers.**—*Brit. Med. Jl.* 1923. May 12. p. 808.

An outbreak of diphtheria took place at a school in Simla in March, 1922. Eight cases occurred between March 14 and 23—all infected by a boy from Karachi, suffering from the disease. The whole school of 200 boys received prophylactic injections of diphtheria antitoxin. Sporadic cases occurred in May (1) and July (2), after which six of the eight original patients were found to be carriers and were segregated. Between September 9 and 14 four more cases occurred and the school was closed.

All the boys and the servants with their families were then examined, and all with reddened throats or large tonsils marked for bacteriological examination. One case of mild diphtheria was thus found, and of 58 other subjects 50 per cent. were found to be carriers.

Evidently where antitoxin is used prophylactically on the outbreak of diphtheria one must look out for a crop of diphtheria carriers, for the symptoms are suppressed, but not the germs, though the author recognizes that probably some of the diphtheroids were not pathogenic. It is also noted that of the 15 cases of diphtheria two were negative bacteriologically and one of these was the only fatal case.

A. G. B.

MOUCHET (R.), VAN NITSEN (R.) & GÉRARD (P.). **A propos de la fréquence des tumeurs chez les Noirs de l'Afrique centrale.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 253–256. [3 refs.]

Reference is made to a previous paper on this subject by two of the authors [see this *Bulletin*, Vol. 15, p. 305]. The present observations were made in the Katanga during two years. Benign tumours apart, they relate to a small-celled sarcoma of the pancreas with metastases in the spleen and two primary carcinomas of the liver. In the first there were no metastases apart from glands in the lesser curvature of the stomach. The second was the case of a labourer who had been admitted to hospital for a fractured humerus and returned two months later with a spontaneous fracture at the callus. There was evidently a tumour, the arm was amputated, and the liver condition found on the operating table. This was a primary cancer of the biliary ducts.

Adding these observations to the former ones, we have 19 malignant tumours, comprising 8 connective tissue, 10 epithelial, and 1 mixed. Of the 10 epithelial tumours 8 were liver cancers.

Reference is made to Harvey PIRIE's paper [*op. cit.*, Vol. 20, p. 213], who attributes this condition to the presence of schistosomes. The authors say that they have looked in numerous sections for schistosome eggs, but have only once found them [*op. cit.*, Vol. 13, p. 203]. Bilharziasis is not seen in Katanga, unless imported. They note that PIRIE found four cancers of the pancreas, an equally unusual proportion, and this is not an organ in which foreign bodies from the blood-current are retained. They think some other explanation must be sought for the frequency of carcinoma of the annexa of the digestive tube in negroes.

A. G. B.

DUBOIS (A.). **Tumeur maligne chez un Nègre Baluba.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 151–152. With 1 plate.

The case of a tumour of rapid growth in the frontal region with a bony edge round the base. It was removed under chloroform and found to have perforated the skull. Examination showed it to be a typical carcinoma, certainly of metastatic origin. No autopsy was made.

A. G. B.

CHOPRA (R. N.) & GHOSH (B. N.). **The Therapeutics of Emetine.**—*Indian Med. Gaz.* 1922. July. Vol. 57. No. 7. pp. 248–253. With 6 charts. [12 refs.]

The emetic action of emetine is due to its locally irritating effect—for a 1 : 500 solution applied to the mucous membrane sets up a severe irritation.

In order to determine the local effect upon the tissues caused by emetine injection, a series of experiments was undertaken on rabbits and the action of tartar emetic and quinine bihydrochloride compared. Both substances caused oedema, and in the case of the latter salt, patches of necrosis; emetine, on the other hand, produced a slight subcutaneous and muscle oedema, no hyperaemia or necrosis. Weak solutions, such as 0·2 per cent., produced little local effect.

After injection emetine can be detected in the stomach, and increases the automatic movements of that organ and also of the intestines. Larger doses cause inflammation of the whole intestinal mucosa, and haemorrhages and even ulceration may occur. These pathological changes point to its excretion by the intestinal mucosa; haemorrhages occur in the lymphatic glands, spleen and kidneys. Peripheral neuritis is produced, as shown by DALE. The diarrhoea occurring during the course of emetine or ipecacuanha administration is probably due to the action of emetine upon the intestinal wall during its excretion. Experiments on isolated pieces of gut from emetinized rabbits and guinea-pigs were carried out. The active piece of gut—2 in. long—was cut out of the lower portion of the ileum and suspended in a warm bath at 37·5° C. Tracings taken showed that even in a dilution of 1 : 250,000 emetine produced a distinct increase in the muscular tone and made peristalsis more regular and powerful ; this probably accounts for the diarrhoea, which should not be difficult to differentiate from that caused by the amoebic infection.

P. H. Manson-Bahr.

ROBERT (Léopold). **Un cas l'anaphylaxie locale à l'émétine. Oedème envahissant, prurit intense, puis érythème vésiculeux consécutifs à des injections d'émétine.**—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 680–683. [1 ref.]

The case of a Siamese prince, aged 41, who received for dysentery four injections of emetine in 1916, and again in 1920, with benefit and without reaction. Two months later he received two injections, and after the second suffered a fugitive oedema and slight itching. A few months later another relapse of dysentery occurred, for which eight injections of 5 cgm. emetine were given. After each there was oedema and pruritus, both increasing in intensity. In 1922 he consulted the author, who found dysenteric amoebae and gave an injection of 5 cgm. in the arm ; 22 hours later it was doubled in diameter, and the swelling extended from the axilla to the hand with much pruritus The brand of emetine was changed and an injection given in the other arm, with the same result, plus fever. A third brand of emetine was now injected in the thigh ; the result was so much oedema that the patient was unable to walk, a large erythematous plaque, much pain and itching, and fever (38° C.). The author gave even a fourth injection, with like results, before suspending treatment.

The patient was then lost sight of for a time, but later received yet another injection from another doctor, when to the above described symptoms were added numerous vesicles on the forearm, remote from the point of entry.

A. G. B.

ARDIN-DELTEIL, AZOULAY (René) & SALLES. **Polynévrite émétinique.** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. May 3. Year 39. 3rd Ser. No. 14. pp. 633–635. [3 refs.]

A tailor, aged 40, with dysentery, received by error six series of three subcutaneous injections of emetine hydrochloride (4, 8 and 10 cgm.), 1·22 gm. in all, between December 14 and January 22. On January 23 he complained of extreme fatigue and weakness, especially in the arms. By February 9 he could hardly walk. He had great difficulty in getting on to his bed and in rising after squatting. Reflexes of upper limbs and knee-jerks diminished. Some diminution of excitability of limb muscles to faradic and galvanic currents. Pulse 120. Three weeks later the patient had recovered, but the reflexes were still diminished. He had received in the same period four injections of arsenobenzol, a total of 0·9 gm. in a fortnight, but it is not thought that the polyneuritis was arsenical. [For emetine poisoning, see this *Bulletin*, Vol. 12, p. 436 ; Vol. 20, p. 62.]

A. G. B.

LICHTENSTEIN (A.). **De giftigheid en de doseering van hydrochloras emetini.** [The Toxicity and the Dosage of Emetine Hydrochloride.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 4. pp. 490–502.

A fatal case of emetine poisoning is described, due to over dosage. Lichtenstein deals once more with the toxic action of the drug, which he considers to be chiefly a paralysing influence on the vagus. Light cases of intoxication (muscular weakness and pain, palpitation, diarrhcea) are common, even after doses thought to be moderate. The author gives his experience in 85 cases of amoebic dysentery, showing that after five injections of 60 mgm. emetine hydrochloride, subsequent injections bring no improvement. He emphasizes the opinion of BALFOUR and PYMAN, who state that it is " useless, unwise and wasteful to subject patients to repeated, long-continued courses of the drug."

W. T. Bais.

MASON (V. R.). **Sickle Cell Anemia.**—*Jl. Amer. Med. Assoc.* 1922. Oct. 14. Vol. 79. No. 16. pp. 1318-1320. With 2 figs. [6 refs.]

Sickle cell anaemia is a persistent grave anaemia, not associated with any palpable enlargement of the spleen, but characterized by the sickle-shaped, oat-shaped or elliptical transformation of many of the red blood-cells. So far only four cases seem to have been noticed, one in a negro, two in patients " described as negroes," and one in a mulatto [see this *Bulletin*, Vol. 7, p. 329].

As regards the condition of the blood, apart from the peculiarity from which the distinctive name is derived, the red cells are reduced to from 2,000,000 to 3,000,000 and the leucocytes are increased to 12,000 to 15,000 or more per cmm., a small number of nucleated reds and a few myelocytes are present, a few reds show diffuse or punctate basophilia, and a large number of reds can be vitally stained with brilliant cresyl blue. In two cases there was a slight relative and a marked absolute eosinophilia. The platelets do not appear to be diminished, but no counts were made ; there is no increase or decrease of fragility of red cells ; the clotting time is normal ; there is marked anaemia with a colour-index near unity.

No parasites have been discovered in blood, faeces, or urine. Syphilis has been excluded. There is no history of haemophilia, but in every case a history of lifelong weakness and general debility, and in one case there was suspicion of congenital taint.

As regards the symptoms, besides persistent weakness, all the cases had swelling of the ankles and ulcers of the legs, and two had repeated attacks of abdominal pain concurrent with fever and jaundice and (in one case) gall-stones.

As regards physical signs, they were those usually encountered in severe and long-standing anaemia ; in three cases the sclerotic had a peculiar greenish colour, and in two there was a slight and general enlargement of glands and scanty pubic and axillar hair.

Of the four reported cases two were males and two females ; two were born in Virginia and had never been far away, one had never left the vicinity of St. Louis, and one came from the West Indies.

The differential percentage count of red cells in the one case here reported was as follows : Approximately normal, 50·4 ; sickle-shaped, 3·4 ; oat-shaped, 14 ; irregular and misshapen, 14·4 ; macrocytes, 11 ; microcytes, 6·8.

In the same case the results of six blood-investigations made at intervals during 12 months show the following figures : Red cells per cmm. varying from 1·96 to 2·75 million, leucocytes from 12,400 to 20,700. Haemoglobin per cent. from 39 to 58. Colour index from 0·8 to 1·2. Neutrophil polymorph percentage from 41·2 to 77·2 eosinophil from 0 to 2, basophil from 0 to 2, small mono from 15·6 to 52·6, large mono from 2 to 7·5, transitional from 0·3 to 3·6, myelocytes from 0 to 7·4. Normoblasts per 250 leucocytes from 0 to 305, megaloblasts from 0 to 4.

A. A.

BERCOVITZ (Nathaniel). **Gangosa in Hainan; Report of another Case.** —*China Med. Jl.* 1922. May. Vol. 36. No. 3. pp. 203–205. With 1 plate.

This is a case report in a male native of a very remarkable degree of ulceration of the nose and mouth, beginning as a bulla. Similar ulceration took place on the neck, and all the affected sites scarred with great contraction so that the orifice of the mouth was reduced to a quarter of an inch diameter [*sic*], and the man became emaciated through under-nourishment. Syphilis was admitted as an antecedent disease; yaws could be excluded.

E. G. G. Little.

PRALL (S. R.). **A Case of Multiple Haemorrhages.**—*Indian Med. Gaz.* 1922. Aug. Vol. 57. No. 8. pp. 299-300.

The patient, a glassblower, aged 23, resident one year in India, was admitted to hospital, having spat about 6 oz. of blood. Haemorrhages were noted on tip and base of tongue, circular patches, one-third inch in diameter; when the clot was removed, oozing continued. There was also bleeding from the gum margins. Petechiae varying in size, having no relation to the hairs, were scattered over the thorax, abdomen and limbs. Soon after admission blood was passed by the urethra, and the next day the temperature rose to 102°. Bleeding into skin and mouth and haematuria continued. A turpentine enema brought away blood, new and old. No malarial parasites could be found. Calcium chloride was given in large doses by the mouth and needle, and three days later the haemorrhages ceased. No quinine was administered. Five months later the patient died suddenly at another station after eight days' illness "from syncope resulting from malignant malaria." Haemorrhage was noted from the tongue and gums and ecchymosis in the conjunctiva.

The symptoms, the author writes, suggested viperine poisoning, but there was no history of such. The diagnosis of scurvy was rejected. [Does not this suggest onyalai, a condition described in the text-books of tropical medicine, a case of which was recently recorded in this *Bulletin* (Vol. 17, p. 241)?]

A. G. B.

MATHESON (Farquhar). **Encephalitis lethargica in Samoa.**—*New Zealand Med. Jl.* 1922. Oct. Vol. 21. No. 105. pp. 267–271.

Seven cases of this affection were treated at the Apia Hospital in 1922, between February and April—the wet season. They were drawn from various parts of the island of Upolu; no cases were reported from Eastern Samoa. Samoa suffered severely from influenza in 1918, and again from a milder epidemic in 1920; in 1921 there was measles. Of the seven cases, which do not seem to have presented unusual features, five recovered and two died; all but one showed lethargy and more or less extensive paralysis. The author is inclined to attribute the high recovery rate to the production of a fixation abscess by the injection of turpentine under the skin.

A. G. B.

CAMPBELL (J. Argyll). **Rickets in Singapore.** [Correspondence.]—*Lancet.* 1922. Dec. 16. p. 1304.

Dr. Leonard HILL has stated on the writer's authority that rickets is prevalent in Singapore in spite of the sunny climate. The writer says that this is an error, rickets is very rare at Singapore, but infantile scurvy is not infrequent and is successfully treated only by change of diet.

A. G. B.

VAN NITSEN (R.). **L'Optochin et le sérum optochinisé dans le traitement de la méningite pneumococcique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2-3. pp. 271-275. [3 refs.]

Optochin, or ethylhydrocupreine, has been recently recommended for the treatment of pneumococcal meningitis, and has been used with success by ROSENOW. The author gives by the mouth six doses of 25 cgm. or three of 50 of basic optochin within 24 hours ; half an hour after the last dose he withdraws 30-40 cc. of blood ; the serum is poured off and, mixed with a little phenol, keeps well. For intrathecal injection 5 cc. are given every 12 or 24 hours till the temperature falls or the meningeal symptoms disappear. Of 16 cases thus treated eight recovered. Of the latter, details are given in a table, which shows the effect of the treatment on the temperature and cerebrospinal fluid, in which in four cases pneumococci were present. In six of the failures intervention was late ; the seventh succumbed to his lung lesions. Whether the action is to be attributed to bactericidal power of the serum or to the minute quantity of optochin contained is unknown. Other methods of treatment have been ineffective. It is generally believed that pneumococcal meningitis is a fatal disease in the native of Belgian Congo, but statistics are wanting. The author stresses the importance of the early employment of the serum.

A. G. B.

CONCEPCION (Isabelo). **The Incidence of Diabetes Mellitus among Filipinos.**—*Jl. Philippine Islands Med. Assoc.* 1922. Mar.-Apr. Vol. 2. No. 2. pp. 57-63. [8 refs.]

The mortality from diabetes has gradually increased in the city of Manila from 0·8 per 100,000 in 1913 to 4·1 in 1920. This is due to the greater accuracy of the vital statistics ; the figures for the *per capita* consumption of sugar in the same years show little increase. The incidence of diabetes in the Philippines is much less than in other countries, including Japan ; 69 cases occurred in Manila in 11 years. A table from IWAI shows Breslau at the top with a mortality of 19 per 100,000 inhabitants, and Moscow at the bottom with 1·7. Intermediate come Calcutta 18·8, Edinburgh 14·7, New Zealand 10·6, Rome 8·6, Havana 3·6, Singapore 2·9. Sixty per cent. of the author's cases were males. The most frequent age period was the decade 40-50, as is the case also with Japanese and Chinese ; among Europeans the disease occurs most commonly between 50 and 70. Diabetes in Filipinos is of a mild type, the mortality is very low, and only a small percentage die from diabetic coma. [Diabetic coma is rare also in India. (See this *Bulletin*, Vol. 16, p. 210, and elsewhere.)]

A. G. B.

TROLLI. **Un cas présentant les symptômes de rhumatisme articulaire aigu, réfractaire aux traitements habituels et guéri à la suite d'injections d'émétique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2-3. pp. 179-182.

An Italian, aged 38, a purchaser of hides, 10½ years in Belgian Congo without illness, even malarial fever, living at Kigoma (Tanganyika) where the climate is good, was seized on June 15 with sharp pains in the arm joints and left leg without fever or other disturbance, leaving him the next day. 17th, return of pains in right shoulder with fever and profuse sweating. 18th, seen by author, T. 38°, right shoulder affected, no effusion or inflammation, blood examination negative for malaria, spirochaetosis and trypanosomiasis; repeated blood examinations revealed nothing. For next seven days the pains passed rapidly from one joint to another, leaving no trace behind, temperature between 38° and 39°, profuse sweats. Acute articular rheumatism diagnosed and salicylate prescribed. June 24, patient admitted to hospital. July 3, fresh attack of pain in left wrist and knees, fever. Treatment by "collobiase" of sulphur and mercury, pot. iod., aspirin, electargol, novarsenobenzol was resorted to without more than temporary benefit, but pain continued in the same irregular manner. By August 17 patient was thin and anaemic, pains were very acute, sweats abundant, with decided odour of mouldy straw. Resort was now had to tartar emetic injections, at first 0·06 gm., rising to 0·1 gm. on alternate days. Improvement set in and was progressive, and on 11th [? September] patient got up feeling well. His health has since been excellent.

The author thinks this may have been acute articular rheumatism, but prefers the diagnosis of undulant fever. Against the former is the failure of salicylates, absence of effusion and swelling, abrupt appearance of first symptoms, absence of heart complications. In favour of undulant fever is the patient's occupation, the character of the sweats, the abruptness of the first attack, and the erratic involvement of the joints. He has no doubt that the disease was brought to an end by the tartar emetic.

[The date on which tartar emetic was commenced is not given, but was apparently in the latter part of August when the disease might be terminating naturally. The temperature chart is not given, and no mention is made of serological tests.]

A. G. B.

OUDENDAL (A. J. F.). **Over het amyloide in de tropen.** [Amyloidosis in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 6. pp. 708-720. With 1 folding coloured plate.

The apparent rarity of amyloid in the tropics is not in accordance with the great prevalence of common causes of this tissue degeneration (chronic ulcerations, malaria, tuberculosis, yaws).

A case is described of a Javanese man of 40 who showed distinct amyloid degeneration of the vessel walls.

DAVIDSON produced amyloid in rats by bacterial irritation in 50 per cent. of his cases, but never succeeded in producing it in animals after previous extirpation of the spleen. The spleen appears to have an active influence on the production of amyloid, either by secretion of ferments or otherwise.

A normal spleen is rarely met with in inhabitants of tropical countries, but in the quoted case the spleen was small and microscopically showed a normal aspect.

Possibly the frequency of morbid affections of the spleen gives the explanation of the rarity of amyloid in the tropics. Other tissue degenerations (fatty, hyaline) are common enough.

W. J. Bais.

KOUWENAAR (W.). **Over Maagzweren in Deli.** [On Gastric Ulcers in Deli, E.C. Sumatra.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1922. Vol. 62. No. 6. pp. 721–740.

Among about 2,000 Chinese coolies in Sumatra, Kouwenaar within two years met with 25 cases of gastric, or duodenal, ulcer, which frequency is remarkable in view of the asserted rarity of this condition in the tropics. In 709 post-mortems in Chinese, 49 ulcers were found either as cause of death (22) or accidentally (27). In Javanese coolies, living under the same circumstances, gastric ulcer is very rare. In Chinese the disease becomes more frequent as age increases, or after a long time spent in the tropics. Possible causes of the liability of Chinese to gastric ulcer are discussed (opium, change of climate, racial difference, the Chinese habit of swallowing food very hot), but no definite conclusion is arrived at. The author, who states that gastric ulcer is fairly common too in European immigrants in the tropics, considers it more useful to find out why Javanese and other aborigines of the tropics do *not* suffer from gastric ulcer.

W. J. Bais.

PENA CHABARRIA (Antonio). **Bubón de Veléz.**—*Repert. Med. y Cirug.* Bogota. 1922. Oct. Nov. Dec. Vol. 14. No. 1, 2, 3 (Nos. 157, 158, 159). pp. 10–32; 52–70; 100–115.

A somewhat lengthy description of a condition one of whose many synonyms is "Espundia," in Peru. In the later stages it bears a strong clinical resemblance to leishmanial espundia. The disease, however, is due to a blastomycosis, and may be divided into two stages. The first is that of a local sore on some exposed part of the body, and is said to arise by mechanical infection of a wound or abrasion by *Musca domestica* or, more probably, the reduviid bug, *Rhodnius prolixus*. This leads to the production of an encrusted ulcer about an inch in diameter, taking several months to reach full development; there are often smaller ulcers in its neighbourhood which in their growth unite with it. After one to three years the secondary stage begins—an ulcerative naso-pharyngitis closely resembling Espundia, which may extend to the larynx and destroy cartilage and even bone. The disease shows no predilection for sex or age, though perhaps it is a little more common in the young.

The diagnosis is discussed fairly fully, particularly the differentiation from syphilis, tuberculosis, and rhinoscleroma. From leishmanial infection it is readily distinguished by the constant presence of the blastomycosis and the absence of Leishmania. The organism is easily cultivated on Sabouraud's media.

Treatment is not very satisfactory. The best results were obtained by a combination of potassium iodide and tartar emetic, the latter intravenously, starting with 2 cc. of a 1 per cent. solution, and, if well borne, increasing to 5 cc. administered every three days.

H. Harold Scott.

VAN NITSEN (R.) & WALRAVENS (P.). **Sur une épidémie de manifestations bronchopulmonaires et leur traitement.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 147–150.

In August and September a broncho-pulmonary epidemic occurred at Likasi (Katanga) among labourers housed in a brick barrack; others inhabiting straw huts kept free. The sequence of symptoms was headache, cough, slight fever, bronchitis with blood-stained mucopurulent or gelatinous sputa. Complications were frequent. Of the 365 cases, 106 had pneumonia, 50, or 13·6 per cent., died, and among these autopsy showed 41 cases of lobar pneumonia, 3 of bronchopneumonia, 6 mixed pneumonia, and 8 pneumococcal meningitis. In 100 microscopical examinations of sputa the pneumococcus was found 57 times, Pfeiffer's bacillus 68 times and *Spirochaeta bronchialis* 78 times, other organisms less frequently.

The clinical course of the bronchitis favoured the diagnosis of bronchopulmonary spirochaetosis which was first reported in the Union Minière in December 1920. The authors consider that upon this soil was implanted the Pfeiffer bacillus, exalting the virulence of the other microbes and especially the pneumococcus. Of treatments tried the most successful was a polyvalent vaccine; of 56 cases treated with this 8·9 per cent. died.

A. G. B.

OUDENDAL (A. J. F.). **De Algemeene Pathologie der Tropische Levercirrhose.** [The General Pathology of Tropical Cirrhosis of the Liver.]—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 236–248. With 14 figs. [1 ref.] Also *Geneesk Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 205–224. With 14 figs. [1 ref.]

Malay and Chinese spleens, as observed at autopsy in Weltevreden, are, relatively to body-weight, considerably larger and heavier than those of Europeans; adhesions to neighbouring structures are also more frequent. The increase of the liver in volume and weight is commonly due to a non-suppurative hepatitis, the stages of which are very fully described and figured in this paper. Ultimately, no doubt, the process—proliferation of connective tissue and hepatic ducts, infiltration of leucocytes, and degeneration of hepatic cells and nuclei—ends in fibrosis. As to the cause of this tropical cirrhosis, the author is inclined to attribute it not to malaria, but to the habitual use of strongly spiced food.

A. A.

PARKINSON (W. R.). **Three Cases of Multiple Symmetrical Peripheral Neuritis following Acute Poisoning.**—*Nigeria Ann. Med. & San. Rep. for the Period 1919–21.* p. 39.

Eight Kroo natives ate cassava which had been poisoned to prevent its removal. One died and three were admitted to hospital six weeks later. The illness began with vomiting for some days, followed by weakness of both arms and legs. There was multiple symmetrical peripheral neuritis affecting legs and arms below the hips and shoulders. Wasting of muscles was general. Reflexes were absent and tactile sensation was dulled. Four months produced little change, and the flexor muscles gradually contracted, as pain forbade the application of splints. The diagnosis was chronic poisoning, the result of acute arsenical poisoning.

A. G. B.

WRIGHT (Clarence). **Some Less-known Methods of Arsenical Poisoning.** [Correspondence.]—*Lancet.* 1922. July 22. pp. 203 204.

When the author was associated with the Chemical Examiner to the Government of India, Madras Presidency, he had to trace the manner of administration of arsenic in 11 obscure cases. Nine deaths proved to be due to " koyahism," to which the death of Alexander the Great has been attributed. *Koyah dhaurwah* is the graduated administration of arsenic and chlorophyll in dry powder form ; *koyah petharah* the development of a strain of yeast plant by faex-culture upon a medium of palmera juice and arsenic ; the latter is practised by the Dravidians. These mixtures, or processes, the author states, have been of great value in malarial regions. Deaths are usually due to amateurs in this line.

A. G. B.

SWARUP (Anand). **Acute " Kodon " Poisoning.**—*Indian Med. Gaz.* 1922. July. Vol. 57. No. 7. pp. 257-258.

Kodon is *Paspalum scrobiculatum*, a kind of millet. It is a cheap grain, largely eaten by poor people in the United Provinces. The author records four cases of poisoning, coming on one and a half hour after eating the flour. The symptoms were giddiness, vomiting for several hours, unconsciousness, small and frequent pulse, cold extremities, tremors ; no change in the pupil and no diarrhoea. All recovered. [*Cf.* this *Bulletin*, Vol. 16, p. 224.]

A. G. B.

WOODCOCK (H. M.). **Are the Active Principles of Filter-Passing and " Ultra-Microscopic " Viruses Living Organisms or Enzymes ?**—*Jl. Roy. Army Med. Corps.* 1922. Oct. Vol. 39. No. 4. pp. 243-260. With 10 figs. [1 ref.]

The author with no little ingenuity here extends the scope and venue of his theory of haematophagy.

According to that theory [see this *Bulletin*, Vol. 19, p. 620] tissue-cells, under the malefic influence of certain stimuli, may become deranged, and may revert to an instinct (normally latent) of feeding on solid food, particularly red blood cells. Among the objective microphysical signs of such abnormal behaviour are perhaps Kurloff, Negri and Guarnieri bodies, Chlamydozoa and the Rickettsiae. As to the morbific stimuli, they, perhaps, are specific ferments which, once started, go on and on like an avalanche.

In the present paper, starting from the minute filterable granules supposed by some to be causal " organisms " of influenza, he develops the theory that these granules are the analogues of the inclusions of Chlamydozoa, etc. ; that they are the results of " autolysis " of tissue cells, brought about by specific autogenous or self-subsisting ferments ; and that the ultra-microscopic filterable viruses in general are self-subsisting ferments of the same nature.

Minute Giemsa-staining granules, quite like the conjectural influenza organisms, can be obtained from normal nasal secretion. In this secretion may be found, *inter alia,* epithelial cells with the nucleus in all stages of disintegration. When the disintegration is complete the nucleus is transformed into dust scattered through the cytoplasm. But this dust, though it stains like chromatin with Giemsa, cannot be chromatin, since it is quite indifferent to iron-haematoxylin—the latter stain apparently being, in the author's opinion, an infallible criterion of chromatin.

So far the author is dealing in verifiable fact. Going beyond these facts, the author is inclined to assume that Rickettsia, and perhaps even other filterable " organisms," which cannot be cultivated, but are associated in theory with definite pathological conditions, may be of the same nature as the influenza " organisms "—protein dust derived from auto-caryolized nuclei.

The author, now fairly entered into the realm of speculation, suggests that this ultra minute protein dust, though it may not be pathogenic in itself, may yet be the outward sign of a pathological process—*non quis sed quid.* It may be the carrier of the pathological ferment by which it was itself produced.

This hypothetical ferment appears to be analogous with the hypothetical pathological ferment that gives rise to haematophagy. As to its origin, if the epithelium of the venom gland of a serpent can produce a cytolytic toxin, if a specific bacterium can produce a bacteriolysin, why may not other tissue-cells under some uncontrollable stimulus produce an auto-cytolytic or auto-caryolytic ferment? Once this ferment is set a-going, it goes on—*crescit indulgens sibi.* Moreover, once this pathological auto-cytolytic process has become established in one individual, might it not be transmissible to other individuals It is here that the ultra-microscopic protein granules—themselves the product of auto-cytolysis—might come in as carriers of the ferment.

These speculations are decidedly interesting and stimulating, and we hope that in the course of time the author may make the origin of the masterful autogenous auto-cytolytic or auto-caryolytic ferment comprehensible.

A. A.

WOODCOCK (H. M.). **"Rickettsia"-Bodies as a Result of Cell-Digestion or Lysis.**—*Jl. Roy. Army Med. Corps.* 1923. Feb. & Apr. Vol. 40. Nos. 2 & 4. pp. 81–97. With 14 figs.; & pp. 241–269. With 9 text figs. [21 refs.]

Bodies, many of which have been specifically distinguished by name under the generic term *Rickettsia*, are now known to be of fairly common occurrence among parasitic, mostly blood-sucking, Arthropods. Usually the Rickettsias are affiliated to Bacteria, although they do not stain—or stain ill—with aniline dyes, take a red or purple stain with Giemsa, and are cultivated with the greatest difficulty, if at all.

The author considers, to begin with, certain granules observed by him in Giemsa-stained smears from the gut of the ked (*Melophagus ovinus*). He considers, with an abundance of figured illustrations, their form, size and staining reactions, their posture and nebular agglomerations, and their association with trophonuclei and kinetonuclei (or with recognizable fragments of these structures), and while finding them quite indistinguishable from the bodies described by NÖLLER as *Rickettsia melophagi*, he concludes that they are really granules resulting from the disintegration—and in some cases the intracellular digestion—of the flagellates (*Crithidia melophagia*) normally inhabiting the ked's gut. Granules apparently identical with Rickettsia have also been traced by the author in smears of a culture of *Leptomonas pattoni*, the flagellate of the European rat-flea, and these also are interpreted as constellations of disintegrated flagellates.

Granules, or bodies seemingly identical with Rickettsia, have also been traced by the author in smears of the gut of a bird-mite (*Dermonyssus*), and are plentifully figured in his paper. The author interprets them as being derived partly from digested nuclei of the bird's red blood corpuscles, partly from disintegration of nuclei of cells desquamated from the mite's gut, and partly (and abnormally) from the ingested (and imperfectly digested) haemoglobin of the bird. These granules can also be seen in the eggs of the mite, and by upholders of the microbial nature of Rickettsia are regarded as evidence of an hereditary infection; the author, however, explains them as being, like the particles of foreign haemoglobin sometimes found in the same situation, deutoplasm or granules taken up and stored in the yolk for the nourishment of the embryo.

Having traced the origin of " Rickettsia bodies " in disintegrated or digested intestinal flagellates, disintegrated and digested nuclei of intestinal epithelium, and imperfectly or abnormally digested haemoglobin, the author finds an obvious connexion between his theory of origin of Rickettsia bodies and his theory of haematophagy as a pathogenic process [see this *Bulletin*, Vol. 19, p. 620]. According to the latter theory, typhus is an abnormal manifestation of haematophagy by endothelial cells incited by some pathogenetic ferment; and according to the theory of Rickettsia-origins the Rickettsia bodies found in endothelial cells in typhus are the evidence of this abnormal process of haematophagy, not the cause of it—*non quis sed quid.*

The author's explanation of the origin of Rickettsia bodies can be followed with the appreciation to which they are entitled only with the help of the actual figures in the text of his paper.

A. A.

BESREDKA (A.). **Immunité générale par immunisation locale.**—*Bull. Inst. Pasteur.* 1922. June 30 & July 15. Vol. 20. Nos. 12 & 13. pp. 473-481; 513-524. [11 refs.]

[Although it opens out ideas of the widest generality, this interesting paper embodies an argument logically developed from experimental data.]

Since the advent of serotherapy, immunization has been assumed to be a matter of antibodies: infection, the demonstration of antibodies, immunity, have been placed in a necessary relation of cause and effect.

This exclusive belief in the phylactic necessity of antibodies remains rooted, despite the facts that in the course of immunization against anthrax antibodies appear late in the day or not at all, that an experimental immunity may not be acquired until antibodies have disappeared, that immunity persists after viricidal properties have gone from the blood, and that there is no constant relation between the viricidal content of a serum and the degree of immunity.

The argument maintained in this paper is that immunity is, in the first instance, the result of local cellular processes achieved in the organ peculiarly susceptible to the particular virus: as a result of infection the particular organ becomes impervious to that virus, and this local immunity has been misconceived as an immunity entirely due to a general reaction of the organism. The author does not reject the doctrine of phagocytosis, nor does he deny that in massive infections, where a virus has broken the resistance of the susceptible organ and burst its primary bounds, other defensive powers, including antibodies, may be brought into action. But he thinks that the theory of phagocytosis is based too much on observation of invertebrate animals, where leucocytes play a predominant or exclusive part in the phenomena of infection and immunity, and that it takes too little account of the fixed phagocytes of vertebrate tissues. He thinks, indeed, that in the conception of an organism as a complex of interdependent organs the fundamental physiological and pathological independence of the individual organ [and tissue] has been too much forgotten.

To follow the steps of the argument: as an example of immunity attained by a particular organ, without any concurrence of antibodies, the author offers a study of anthrax in the guinea-pig. In the guinea-pig anthrax is primarily—perhaps purely—an infection of the skin, for if great care be taken to avoid contaminating the skin pure anthrax virus can be injected into the animal's peritoneum without any ill-result. The animal, however, is not immunized against anthrax by any such treatment, and is, indeed, one of the most difficult of all animals to immunize by any method except by inoculating the virus *into* the skin. By inoculation *into* the abraded skin the animal can be brought to tolerate enormous doses of virulent anthrax—and without the appearance of antibodies. The skin is the organ susceptible to this infection, and the skin alone is docile to immunization.

As an illustration of immunity acquired or created by a particular organ, with inert concurrence of antibodies, some observations on vaccinia in the guinea-pig are offered. Although its selective affinity for skin may not be so pronounced as that of anthrax, vaccine virus affords another instance of cuti-infection, cuti-vaccination, and cuti-immunity. It vaccine virus is injected into the peritoneum of a guinea-pig (with due care to avoid contamination of the skin), the animal is not thereby vaccinated, although antibodies appear; it still remains susceptible to vaccination into the abraded skin. Antibodies appear howsoever the vaccine is introduced, but they have no immunizing properties when they are injected separately from the virus.

Instances of the existence of a localized natural resistance, which can be weakened or strengthened artificially, are afforded by the pulmonary epithelium. To kill a rabbit by intra-tracheal injection of paratyphoid virus, ten times the dose sufficient for subcutaneous injection is required; but this lethal intra-tracheal dose can be reduced to one-fiftieth or to one-hundredth if the pulmonary epithelial barrier be breached—as by the action of bile. On the other hand, the pulmonary epithelial barrier can be strengthened, as is shown in experiments where two series of guinea-pigs were vaccinated thrice successively with killed diphtheria bacilli—one series by way of the trachea, the other series subcutaneously: when, subsequently, the individuals of both series were inoculated severally with a lethal dose of living diphtheria bacilli, only those that had been vaccinated by way of the trachea survived. In these experiments no antibodies could be discovered.

The author next brings forward examples of viruses which, though they may appear to strike all parts of an organism with equal severity, and though their endotoxins act more or less banefully on the tissues generally, yet have a strong selective affinity for the intestine, namely, the viruses of dysentery (Shiga), typho-paratyphoid, and cholera.

If a strong dose of the Shiga virus be injected into the vein of a rabbit's ear and the animal be examined immediately after death the bacilli will be found in swarms throughout the small intestine, but not in the blood, or urine, or in other organs. The small intestine is for this bacillus what the skin is for anthrax. Similarly the intestine of the rabbit can best be immunized against this bacillus by the buccal route; and this holds good for man also, for NICOLLE introduced living dysentery virus *per os* into two persons who had been vaccinated *per os* with killed dysentery cultures, and two persons who had not been so vaccinated, with the result that the two former were not affected, whilst the two latter contracted dysentery [this *Bulletin*, Vol. 20. p. 115.] Here we have an illustration of entero-infection, entero-vaccination, and entero-immunity.

In the case of man the special affinity of the typho-paratyphoid and cholera viruses for the small intestine needs no comment, but in the case of the rabbit this affinity is completely occulted, when the bacilli are swallowed, unless the intestine has been cleared of its protective mucus by a powerful cholagogue such as ox-bile.

It follows from this series of observations that for immunizing-vaccination against these entero-infections the buccal is the quickest and most direct route; the intestine will certainly be reached by other routes, but with delay and loss *en route.*

A. A.

LEVADITI (C.) & NICOLAU (S.). **Ectodermoses Neurotropes. Etudes sur la Vaccine.**—*Ann. Inst. Pasteur.* 1923. Jan. Vol. 37. No. 1. pp. 1–106. With 2 coloured plates, 17 text figs., 7 charts and 14 diagrams. [Numerous refs. in footnotes.]

This instructive and suggestive study of the virus of vaccinia is a logical issue of LEVADITI's theory that while *Mesodermoses*, or infections of tissues of mesodermal origin, are generally effected by bacteria or fungi or spirochaetes or protozoa, *Ectodermoses*, or infections of tissues derived from the ectoderm, are for the most part provoked by filtrable ultra-microscopic viruses.

Among the ectodermoses LEVADITI distinguishes a Neurotropic group, including cowpox, encephalo-meningitis, and herpes—all intimately related—to which the present paper may be regarded as a master-study.

Having, by a described technique, obtained a fixed vaccinia virus, or neurovaccine, comparable by standards of constancy with fixed rabic virus, the authors have investigated its nature and properties, its election for tissues, and the arcana of its immunization.

This neurovaccine, obtained by passage of vaccinia virus through brain of rabbits, is an energetic virus whether by cerebral or cutaneous route, and its virulence can be long conserved in glycerine or glycerinated yolk of egg (at least 205 days in glycerine in the refrigerator). It differs from ordinary stock vaccine ("dermovaccine") in its more definite neurotropic affinities, its subtler selection of the ectodermal elements of the integument, and its greater sensibility to heat (being destroyed at 55° C.=131° F.). Man reacts to it by cutaneous inoculation almost exactly as to ordinary vaccine ("dermovaccine"), over which it has the practical advantages of purity, constancy, and long keeping. Of all animals the rabbit appears to be the most susceptible, equally by intracranial or cutaneous or intravenous route, or even by inoculation into a peripheral nerve; and in this animal the virus tends when inoculated into one susceptible tissue to become generalized in others—*e.g.*, when inoculated into the brain to attack also the depilated skin and the buccal mucosa—and this selective generalization is rapid.

The virus has a particular election for tissues of ectodermal origin—skin, cornea, brain, bucco-pharyngeal mucosa, and mammary gland, but most particularly for the first three. This selective affinity is not quite exclusive, but is also extended to certain endodermal derivatives, namely, the epithelium of the lungs, the germinal glands, the suprarenal capsules and (doubtfully) the liver. The virus completely disregards tissues derived from the mesoderm ; for instance, it is quite inert when injected into the peritoneum. Its affinity for ectoderm is well exemplified when it is injected into a blood-vessel of a rabbit having a patch of skin depilated : on the fourth day after the injection an eruption appears on the depilated patch. Histological investigations of the depilated patch show that there has been an initial diapedesis of leucocytes (probably consequent on depilatory injury), then immoderate mitotic proliferation—almost neoplastic in effect—of the cells of the Malpighian layer and follicles, and last of all necrosis and invasion of the proliferated nests of cells by phagocytes. The virus, which revels in the actively proliferating nest of cells, is thus proliferative and necrotic in action.

Experiment shows that neurovaccine confers immunity against dermovaccine, and vice versa ; and that, with the single exception of the cornea, any particular ectodermal tissue in acquiring immunity to the virus imposes or entrains immunity on the other susceptible tissues. For instance, when as a result of local inoculation the skin has acquired immunity, that immunity is equally shared by the brain and testis.

The authors, however, do not countenance the theory that the general ectodermal immunity following successful resistance to an infection originally localized in one ectodermal tissue is due, to any great extent, to microbicidal principles circulating in the blood. On the contrary, they hold that each ectodermal tissue makes its own cellular resistance to the virus, and that the generalized immunity is in the main a confederation of individual and independently acquired immunities. They base this view on experimental observations, the gist of which may be briefly sketched as follows :—

(1) The virus itself does not remain localized in the ectodermal tissue into which it was inoculated ; neurovaccine injected into testis or trachea soon appears in a scarified skin. (2) Excision of an original focus of inoculation, even after an interval as short as 48 hours, does not prevent the acquirement of generalized immunity. (3) Actual lesions are sometimes found in ectodermal tissues other than the one originally inoculated with the virus. (4) In the brain of a susceptible animal the virus lives and flourishes for several days ; in the brain of the immunized animal it is destroyed very rapidly. (5) Partially immunized ectodermal tissues show the reactionary cellular proliferation. (6) The triturated brain of an immunized rabbit will completely fix the virus in vitro, while its serum will do so only to a limited extent. (7) In the blood of animals vaccinated against herpes no antibody capable of destroying encephalitic virus can be found, whereas the brain of such animals fixes and destroys that virus.

The authors have been led to a supplementary study of the ultramicroscopic virus of contagious epithelioma of fowls, which has considerable affinity with that of vaccinia. It also, when injected into the blood of the fowl, shows an affinity for the germinal cells of the ovary and for the axial nervous system, and when inoculated into the skin of the rabbit excites mitotic proliferation of the epithelial cells. In particular circumstances it can excite or can inhibit the natural or the acquired immunity of the cock's comb to vaccine virus.

The conclusion as regards these ectodermoses is that each susceptible tissue defends itself by the activity of its own cells. Immunity once acquired is transmitted to daughter cells, and so on to descendants, though in course of time the immunity wears out. It will wear out quicker in a tissue, like skin, that proliferates quickly than in a tissue, like brain, that proliferates slowly if at all; and in an epithelial neoplasm proliferating with peculiar rapidity its duration will be transient, and this may perhaps explain the peculiar behaviour of vaccine virus in contagious epithelioma of the cock's comb.

A. A.

CHAPEYROU. **Considérations générales sur la climatologie, l'hygiène et la pathologie de la région de Fort-Lamy.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 188–193.

Fort-Lamy, situated in the French Colony of Chad to the south-east of the lake of that name, on the Shari river at 12° north, has a climate which is both tropical and Saharan. Variations of 20° C. in the 24 hours are common in the dry season. The author describes four seasons—a dry+cold, dry+hot, rainy, and hot+humid. The situation of the town is described as very insanitary. The chief causes of admission to hospital are trypanosomiasis (242 cases), syphilis (282) and traumatisms. Eight of the trypanosomiasis cases came from Fort-Lamy itself, the majority from villages on the Logone river, which enters the Shari here. *Glossina palpalis* is not found at any nearer point than Fort Archambault (300–350 miles away), but *G. tachinoides* is common and causes trypanosome infections in cattle and horses if they remain near the river between June and November. Other common affections of this region are guinea-worm and inflammatory diseases of the eyes.

A. G. B.

MATTLET (G.). **Service médical de l'Urundi. Rapport sur l'exercice février-décembre 1921.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 155–159.

This paper is dated from Kitega, Urundi. Here, at 1,600–2,000 metres altitude, are found malaria, a fever resembling typhoid, but giving no agglutination with T., A. or B., yaws and leprosy. A case of tuberculosis was seen. Yaws is widespread, the early stages in children; in the adults tertiary lesions, injuring the skin, deforming the long bones, ankylosing the joints, eroding the mucosae and destroying the bones of the face. A Taenia, said to be *T. saginata*, is common.

A. G. B.

RODHAIN (J.). **Contribution à la pathologie indigène du Bas-Congo. Notes cliniques.**—*Ann. Soc. Belge. de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 141–146. With 1 text fig.

Cases are described of arterial aneurism and glandular tuberculosis. An old woman had an aneurism of the aorta of five years' duration, which had eroded the manubrium sterni. A second case was that of aneurism of the femoral artery, and a third of the left subclavian artery. These three were seen in eight months. The cause is obscure. The tubercular case was a boy of 12, who was admitted with axillary and crural glandular enlargements. Trypanosomal and filarial infection having been excluded, axillary glands were excised and two guinea-pigs inoculated. One died three months later with generalized tuberculosis and the histological examination of the glands confirmed the diagnosis. The author remarks on the rarity of this form of tuberculosis in the Lower Congo region.

A. G. B.

i. KUNO (Yas). **Ueber die Schweisssekretion des Menschen.** [Sweat Secretion in Man.]—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 260-270. With 7 text figs.

ii. ——. **Ein Apparat für die Bestimmung der Schweissekretion.** [An Apparatus for Estimating the Secretion of Sweat.]—*Ibid.* pp. 271-273. With 1 text fig.

i. The phenomena of perspiration are considered under the following headings:—in different regions of the body (tabulated observations); as influenced by meteorological conditions; as affected by muscular fatigue, hunger, debauch, and disease. The subject is dealt with from a physiologist's standpoint.

ii. An ingenious apparatus for estimating the perspiration with a hair-hygrometer is here figured and fully described in itself and in its use. The author calls it a "perspirometer"; "hidrotometer," or even "hidrometer," would have been better, and also somewhat shorter—or "hidrotiometer."

A. A.

i. SNIJDERS (E. P.) & STOLL (A.). **A Case of Rhinoscleroma in a Malay Woman in Sumatra.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 296-297. With 1 plate.

ii. SCHRIEKE (B.). **Some Remarks on Circumcision in the Dutch Indies.** [Abstract.]—*Ibid.* pp. 241-254.

iii. VON ROEMER (L. S. A. M.). **About the Exhibition in Connection with the Fourth Congress of the Far Eastern Association of Tropical Medicine held at Batavia from 6th-13th August 1921.**—*Ibid.* pp. 381-393. With 20 illustrations.

i. This case is described as being extremely rare in the Netherlands East Indies; indeed, the authors have been unsuccessful in their search for another case and even for any record of a case.

ii. An abstract of what appears to be a very discursive anthropological dissertation in which the practice of circumcision and other interesting practices and mutilations form the basis of much speculation. The indigenous operations of circumcision are not included in the abstract.

iii. Among the objects of interest exhibited may be mentioned, as illustrating the progress of local Dutch enterprise, material and products of the Government cinchona plantations and quinine factory, and of the Government rubber plantations and opium factory; specimens of medicinal plants and their products, including chenopodium, chaulmoogra oil, ipecacuanha, and coca.

A. A.

CHOPRA (R. N.) & GHOSH (B. N.). **The Field for Research in Indian Indigenous Drugs.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. pp. 99–104.

COPPIN (H.). **Note sur un cas d'aérophagie chez un Annamite.** *Bull. Soc. Méd.-Chirurg. Indochine.* 1922. Oct. Vol. 1. No. 1. pp. 7–10.—[A Case of Air Swallowing without Special Features.]

FABRE (R.). **Quelques considérations sur les Alcaloïdes du Quinquina utilisés en thérapeutique.**—*Rev. Prat. Malad. des Pays Chauds.* Paris. 1923. Apr. pp. 189–193.

FIESSINGER (Noël). **Les Ictères par Hépatite.**—*Rev. Prat. Malad. des Pays Chauds.* Paris. 1923. Apr. pp. 143–154. [15 refs.]

MONROE (Willys M.). **Breve sumario de los rasgos más salientes en el trabajo contra la Anemia Tropical en Columbia durante el año de 1922.**—*Repert. de Med. y Cirug.* 1923. Feb. Vol. 14. (No. 161.) No. 5. pp. 183–188.

PÉTRAULT (Th.). **Quelques réflexions sur le traitement de la bronchopneumonie infantile à l'Hôpital indigène du Protectorat à Hanoi.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1922. Oct. Vol. 1. No. 1. pp. 27–48. With 4 charts.

SAMBON (Louis W.). **Pasteur and his Work Historically Considered.**—*Jl. Trop. Med. & Hyg.* 1923. May 15. Vol. 26. No. 10. pp. 151–177. With 2 plates and 22 text figs. [Refs. in text and footnotes.]

SCHOTTE. **L'exercice de la médecine dans une île du Pacifique.**—Reprinted from *Jl. des Sciences Médicales de Lille.* 1922. June 18–25. 12 pp.

REVIEWS AND NOTICES.

HONIG (P. J. J.). **Studie over de malaria te Nieuwendam en omgeving.** [Essay on Malaria at Nieuwendam and Environment.]—M.D. Thesis. Amsterdam: 1922. 79 pp. With 10 maps & figs.

If after 20 years of general practice a man can find time and energy to write a M.D. thesis, he certainly commands our admiration, and if he happens to be a shrewd observer and is conversant with the literature of the subject, we may expect an interesting and useful contribution to knowledge. In this case our expectations are fully justified.

The author's terrain of observation comprises five small villages, conveniently divided into two groups, one containing three villages built along the dike, and the other two villages in the " polder." Differences in the structure of the houses and the presence of neighbouring stables in the "polderland" favourably influence the incidence of malaria as compared with the low-built and dark houses on the dike.

Adopting Ross's thick-drop method, the author found that in 1920 14·26 per cent. of the population was infected, while in 1921 the figure was only 7·23 per cent. This marked drop was due to (*a*) the filling up of a complex of ditches which were very favourable breeding-places for *Anopheles maculipennis* (the only malaria mosquito to be found in that neighbourhood, (*b*) systematic mosquito hunt, (*c*) the high salt contents of the water after the prolonged drought.

Applying the law of average, the author confirmed the observation of others that in so-called " malaria-houses " the incidence of infection among the inhabitants is considerably higher than in the other houses. He attributes this to three possible causes :—

1. Preference of the anopheles for certain houses.
2. Their tendency to remain indoors during the development of the oocysts.
3. Their capability to infect several persons in one night.

This last possibility was clearly demonstrated in a case observed by SWELLENGREBEL : a person was bitten by a mosquito, but before it had sucked any blood the mosquito was caught. Dissection showed the salivary glands to contain sporozoites in great numbers. Ten days after the bite the person developed tertian malaria.

From his investigation of patients' blood and of mosquitoes during winter, the author comes to the conclusion that the great majority of malaria cases occurring in spring or early summer must have been infected in the previous autumn. In contrast to observations previously made by others, the author saw no increase of malaria after the serious floods of 1916, which devastated large parts of the province of North Holland.

This well-reasoned thesis clearly illustrates how the general practitioner can be a most effective first line of defence in our battle against disease.

T. Joekes.

STITT (E. R.). [Rear Admiral, Medical Corps, and Surgeon General, U.S. Navy.] **Practical Bacteriology, Blood Work and Animal Parasitology, including Bacteriological Keys, Zoological Tables and Explanatory Clinical Notes.**—xv + 766 pp. With 1 plate & 202 other illustrations containing 675 figures. Seventh Edition, Revised & Enlarged. 1923. London : H. K. Lewis & Co., Ltd. [Price 21s. net.]

That this work, which was first published 14 years ago, supplies a very distinct want is shown by its evident popularity, for it is now our privilege to welcome the seventh, enlarged and amended, edition. Though not essentially altered in character, it has been augmented by 132 pages and now forms quite a bulky volume. Recent advances in biochemistry and serological tests, such as the Sachs-Georgi flocculation reaction and various modifications of the Wassermann test, are fully dealt with. The appendices contain a large amount of accurate information, where among other things the vitamins are described and the foodstuffs that contain them are tabulated at some length, so that what was originally a handbook on bacteriology and parasitology has gradually come to include a good deal of medicine. In entomology the description and classification of mosquitoes now occupies a considerable section. We note with some surprise that the generic term *Borrelia* is adopted for the spirochaetes of relapsing fever, a term evidently proposed by Swellengrebel in 1907. This seventh edition is bound to enhance the reputation of this handy book; and if the compression of *multum in parvo* has been the chief aim of the author, one must admit that in this respect Stitt's Practical Bacteriology stands without a peer.

P. H Manson-Bahr.

Errata et Corrigenda.

Vol. 20,	No. 6.	p. 511.	4th para. from bottom, lines 3 and 4, *for* "3 with Gordon's Type II" *read* "3 with Gordon's Type III."
do.	No. 7.	p. 547.	"Haemogregarines" in Man. The magnification of Fig. 10, 1 × 1,000, was omitted.
do.	do.	p. 576.	Summary of Castellani, line 3, *for* 5 cc. (injection of phosphorated oil) *read* 5 minims.
do.	do.	p. 584.	Summary of Coles, line 3, *for* 91 *read* 9.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 9.

SLEEPING SICKNESS.

KLEINE (F. K.). **Zur Epidemiologie der Schlafkrankheit.** [The Epidemiology of Sleeping Sickness.]—*Deut. Med. Woch.* 1923. Apr. 20. Vol. 49. No. 16. pp. 505–506.

As the result of various enquiries, Kleine finds it necessary to return once more to the question of the alleged identity of the human parasite *T. rhodesiense* and *T. brucei*, the cause of disease in cattle, horses and dogs, and furthermore to the rôle which the game plays in the spread of sleeping sickness. In Kleine's opinion, the identity of *T. brucei* and *T. rhodesiense* is in no way proved and is extremely improbable. In most regions of East Africa where cattle and dogs rapidly die of nagana, human trypanosomiasis is unknown. The author thinks that BRUCE's argument that in the past blood examinations were not made and that consequently some deaths recorded as due to malaria may have been due to trypanosomiasis cannot hold of German East Africa, because under KOCH's direction blood examinations of natives and Europeans were made in great number, and also later, when it was found experimentally that *G. morsitans* could transmit *T. gambiense*, many blood examinations were made in *morsitans* areas; all these examinations were negative. TAUTE and HUBER's inoculations are also referred to [this *Bulletin*, Vol. 15, p. 35].

Some claim to probability has the view that *T. gambiense* and *T. rhodesiense* are identical and that the infection was spread eastwards from West Africa by commerce; both *G. morsitans* and *G. palpalis* have been shown experimentally to be capable of transmitting either trypanosome. Reference is made to MURRAY's statement that sleeping sickness did not occur in Nyasaland previous to 1907 or 1908, and that it was introduced from Tanganyika or Northern Rhodesia [this *Bulletin*, Vol. 19, p. 129]. In reply to BRUCE's contention that sleeping sickness in Nyasaland differs in certain respects, notably in virulence, from that found elsewhere, Kleine states that he saw no difference between that met with in Rhodesia and that in the Sese Islands. Possibly the character of the infection in Rhodesia has changed and lost its pristine virulence; the disease in the Lake Victoria region was very virulent to begin with. How the infection becomes gradually less virulent is unknown, but in Kleine's opinion this takes place as follows:—Different strains of the same trypanosome exhibit different degrees of virulence and certain strains of true *T. gambiense* produce death less rapidly than others; the less virulent strains are more likely to get into the fly since patients with a more virulent strain keep to their huts and die sooner; consequently, after a time, when the first virulence of the epidemic is past, the infection assumes a more chronic form. The view that the strains after passage through the fly are constant in virulence is unproved and doubtful. It is difficult to infect fly with parasites that have been a long period in the vertebrate host; the infection takes place best from a freshly infected animal.

That the game can under natural conditions harbour the human parasite is certain, but whether the infection of the game has any significance in the spread of sleeping sickness is not yet shown. Experience in German East Africa indicated that this was not the case. On Lake Victoria the numerous cattle of the Wagaia, who suffered greatly from sleeping sickness, were not infected, although the place swarmed with *G. palpalis*; on Tanganyika in one district where 25–80 per cent .of the population had sleeping sickness, only 3·5 per cent. of the domestic stock were infected with *T. gambiense* and the few game were free from infection. In laboratory experiments goats and sheep and antelopes were not specially susceptible to *T. gambiense.* Furthermore, sheep and goats tend to recover from the infection.

The finding of KINGHORN and YORKE that 16 per cent. of the game in the Luangwa Valley were infected with *T. rhodesiense* is certainly an error, since *T. brucei,* which is so frequently encountered in game, was not mentioned by these authors. [KINGHORN and the reviewer believe that *T. rhodesiense* and *T. brucei* are identical and consequently it matters little in this connexion whether the parasite found by them in game be called *T. brucei* or *T. rhodesiense.*] Kleine believes that *T. brucei* can only be distinguished from *T. rhodesiense* by inoculation experiments into man. There follows a reference to the statement of MAY that the infection in Rhodesia followed the movement of natives, the majority of the cases being found around the chief trade centre, where in general were fewer game than in places free of infection.

The general conclusion is that the cause of animal trypanosomiasis, viz., *T. brucei,* is not identical with that of human trypanosomiasis, viz., *T. rhodesiense.* The latter is probably identical with the trypanosome causing sleeping sickness in the Congo and around Lakes Tanganyika and Victoria. The chief reservoir of the trypanosome is man; whether and in what manner the game play a part in the spread of the disease is unknown. [Pending further scientific observations and experimental work, it seems unnecessary to add any comment; the matter has frequently been discussed in great detail and in the reviewer's opinion this article is a mere re-statement of Kleine's views and does not advance knowledge.]

W. Yorke.

ORPEN (R. W.). **Report on Sleeping Sickness in Eket District, Southern Nigeria.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 93–99. [2 refs.]

With the object of ascertaining the present position of sleeping sickness in Eket, Southern Nigeria, the author made a tour of the district during April and May, 1922. He quotes from MACFIE & GALLAGHER's report [this *Bulletin,* Vol. 5, p. 90] on sleeping sickness in the Eket district in 1913 as follows :—

"During the sixteen months in which sleeping sickness has been under investigation, two hundred and twenty-two cases have been identified in which the trypanosomes have been demonstrated. In addition one hundred and fourteen cases have been met with presenting some of the clinical features of the disease, but in which parasites have not actually been found. There can be little doubt that the majority of these were cases of trypanosomiasis."

Unfortunately, the nominal roll of cases made by MACFIE was not available, but Orpen assumes that the 222 cases include 89 definitely *recorded* cases, lists of which, either in manuscript or typescript, were compiled in 1912 by FORAN and GRAY, with a signed statement to the effect that all had been diagnosed microscopically. Of these 89 cases, Orpen was able to trace 35, details of which are given in two tables; 23 of them are still alive and apparently free from trypanosomiasis, and 12 are dead, 6 apparently from sleeping sickness and 6 from either influenza or smallpox.

Apart from these 35 *recorded* cases, Orpen saw at Eket 28 *unrecorded* cases whom he accepted from evidence as being former patients in the camp; all were in good health and did not exhibit any sign of trypanosomiasis. He was informed of the deaths of 7 *unrecorded* cases who were stated to be inmates of the camp.

In an endeavour to ascertain whether trypanosomiasis is still prevalent in the Eket district, as many persons as possible were examined in the towns and villages visited. In all, 1,806 persons were examined by gland palpation. The results are set forth in a table in the manner adopted by MACFIE and GALLAGHER. On comparing Orpen's table with MACFIE and GALLAGHER'S, a striking reduction is seen in the proportion of persons with enlarged glands; only 23 cases were seen which exhibited signs suggestive of sleeping sickness, *e.g.*, enlarged glands, but gland puncture and blood examination were negative.

The article concludes with the following passage :—

"Sleeping sickness has not been demonstrated during the recent tour in Eket, although the cases selected for examination were chosen as presenting clinical signs of possible trypanosome infection. The natives themselves are of the opinion that the disease has died out, and this statement is borne out by the members of the Qua-Ibo Mission; at the same time this must not be accepted as a definite statement, because, as already noted above, the natives are not inclined to discuss the subject, and I am strongly of the opinion that a number of possibly genuine cases were removed from villages on my approach."

W. Y.

JAMOT (E.). **Un nouveau foyer de Trypanosomiase humaine au Tchad.** —*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 93–96.

Reference is made to the report of MURAZ on human trypanosomiasis in the Chad district, where it is recorded that the disease does not extend beyond 10° N. [this *Bulletin*, Vol. 19, p. 500]. In December, 1921, Jamot made a rapid examination of the villages on the tributaries of the Logone and Chari in the vicinity of Fort Lamy (12°). The chief focus of the disease appeared to be at Kabé, where canoes are constructed and which is much frequented by fishermen; 32 infected persons were found among a population of 107 examined (30 per cent.). At Kousseri 13·5 per cent. and at Fort Lamy 2 per cent. of those examined were found to be infected. *Glossina palpalis* was not found and if it exists must be very scanty; there exists a striking parallelism between the distribution of *G. tachinoides* and that of the disease.

W. Y.

VALCKE (G.). **La maladie du sommeil sur le bief Bukama—Lac Kisale.** —*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 63–72.

The observations recorded in this note are the result of a tour of inspection on the Lualaba between Bukama and Numbi on Lake Kisale.

A general account of the country is given; it was found to be insufficiently cleared of brush and undergrowth. The number of tsetse, *G. palpalis*, vary much according to the season. There appears to be little trypanosomiasis among the people; of 2,473 natives examined, only four were found to be infected. Various recommendations for dealing with the situation are made.

W. Y.

GRIFFIN (R. G.). **Some Observations on the Condition of Lymphatic Glands (with Special Reference to those of the Axillary Groups) noted among Trypanosome-Infected Subjects in the Sleeping Sickness Area of Bukedi, Eastern Province, Uganda.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 55–60.

The following summary is given :—

" (*a*) The axillary glands should be systematically examined in all cases [of suspected human trypanosomiasis], otherwise many infected people will be overlooked.

" (*b*) When bilateral axillary enlargement is found in a known infected area, the case should be regarded as highly suspicious, and in those cases where gland puncture is negative, systematic examination of the blood or animal inoculation should be carried out.

" These notes, of course, do not relate to special hospital or laboratory work, but are brought forward as they may be interesting to those who are working on sleeping sickness investigation ; they may also be useful to those who, like myself, are district medical officers, and have to include sleeping sickness control and observation in their administrative and other duties, and who are unable to spare the time necessary for blood examinations, etc. One is often dependent on gland examination and puncture in order to arrive at some idea of the degree and severity of infection in an area.

" The examination of axillary glands in these natives is by no means an agreeable undertaking. However, the work can be made less unpleasant by keeping a couple of ' boys ' in advance, one with soap and water and the other with a dry towel to prepare the cases for examination.

" I understand that no depopulation of the Mjanji area was carried out at the time of the epidemic, and thus no break exists in the age-old distribution of human trypanosomiasis around the Kavirondo Gulf. The same state of affairs, I think, exists in the Mpologoma and Kuamu infected areas. There is a considerable amount of communication between these areas, and the inhabitants frequently move their residence from one to the other."

W. Y.

UGANDA PROTECTORATE. **Annual Report on the Bacteriological Department for the Year ended 31st December, 1922.** [DUKE (H. Lyndhurst).]—17 pp. 1923. Entebbe : Govt. Printer.

That portion of the Report dealing with trypanosomiasis is divided into three portions. The first briefly records the fact that transmission experiments have been carried out with laboratory-bred Glossina and two strains of trypanosomes which have been kept up by direct transmission since 1920. These experiments have yielded important results which will be published elsewhere. The next portion summarizes the work done by the author whilst investigating the Mwanza outbreak, which has been recorded in detail elsewhere [this *Bulletin*, Vol. 20, p. 309]. The last portion relates to the reclamation of the shores and islands of Lake Victoria. During the year, territory in the Lake Victoria *palpalis* areas has been reopened to native occupation, about 9,000 natives having returned to the Sese and Buvuma Islands, and landing places have been cleared at intervals along the mainland shore of Buganda Kingdom. It is anticipated that sooner or later cases of sleeping sickness will occur amongst the repatriated population and it is of the utmost importance that such cases be recognized as early as possible in order that the factors governing the reappearance and spread of the trypanosome in man may be studied and controlled. As it is not practicable to examine all repatriates it has been decided to concentrate attention on the fishermen, who will be licensed to fish in the re-opened area. Details of the proposed measures are given. Up to the present, no cases have been reported from the reclaimed areas of the Buganda Kingdom, which include the Sese Islands.

W. Y.

DAVID (J.). **Observation de Trypanose humaine.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 227–230.

An account is given of a case of sleeping sickness (*T. gambiense*) contracted in the Belgian Congo in the Kwango district. The first symptoms were noted in December, 1920, and a diagnosis was made in February, 1921. During the following 12 months the patient was subjected to four courses of treatment consisting of atoxyl, emetic, neosalvarsan and tryparosan. As a result the condition of the patient improved and he increased in weight, but parasites were still present in the blood. He was then sent to Hamburg and given a course of " Bayer 205 " consisting of 0·5 gm. on March 30, 1922, 1 gm. on March 31, 1 gm. on April 3, and 1 gm. on April 8. The result is most encouraging ; parasites at once disappeared trom the blood and had not returned by June 13. A trace of albumen appeared in the urine shortly after the last injection and persisted till May 12. Further details are to be given later.

W. Y.

OUZILLEAU & LEFROU. **Le traitement de la maladie du sommeil par l'atoxyl. Sa réglementation.**—*Ann. Inst. Pasteur.* 1923. Mar. Vol. 37. No. 3. pp. 275–293. [8 refs.]

The authors point out that a definite decision regarding the best means of administering atoxyl in human trypanosomiasis has not yet been reached, and in the present paper they compare the results obtained at Brazzaville with the various methods commonly adopted. They remark that many of their cases had emetic in addition, but as this was always given in doses of 0·05 to 0·1 gm., according to the weight of the patient, it can be regarded as a constant.

The treatment of patients in the early stage of the disease is considered in the present paper.

A.—*Treatment with small doses of atoxyl.*—These doses are in general less than 0·01 gm. per kilo of body weight, *i.e.*, between 0·3 gm. for a child and 0·5 gm. for an adult. The method adopted at Brazzaville was to inject 0·5 gm. every seven days in the case of natives and every five days in the case of Europeans. Of the 39 cases so treated, all relapsed save one—eight within two months of the cessation of treatment and 30 within a year.

B.—*Treatment with moderate doses of atoxyl.*—These doses are approximately 0·01 gm., or rather more, per kilo of body weight; they vary from 0·5 gm. to 0·75 gm. for an adult. Many patients were treated by this method during 1916–19; the treatment commenced in the first year by a series of weekly doses of atoxyl alternating with emetic; the following and subsequent years the injections were spaced or the dose increased according to the condition of the patient. Treatment was suspended after two or three years when the patient appeared to be maintaining his condition. The duration of the treatment varied considerably; cases could rarely be kept under observation for more than two years, but some (about 5 per cent.) were observed for long periods up to 12 years and others disappeared in the course of treatment. This method gave on the whole poor results.

C.—*Treatment with large doses of atoxyl.*—These varied from 0·015 gm. to 0·02 gm. per kilo, *i.e.*, from 1 gm. to 1·25 gm. for an adult. Since 1920, this method has been carefully tested at Brazzaville. Experience showed that a series of large doses gave the best results. Although, however, it is possible to sterilize definitively some patients by one or two large doses of trypanocidal substances, particularly atoxyl, yet one must not ignore the fact that relapses occur even under these conditions. Should the injections follow one another rapidly? Should the doses be increased or should a prolonged series of injections be given, and, if so, what should be the duration? With reference to such questions as these, it was found that with large doses there should, in order to avoid toxic symptoms, be an interval of 10, or better 14, days between the injections. It was eventually considered best to administer 0·015 gm. per kilo, sometimes rather more, *i.e.*, 0·015 gm. to 0·02 gm., in a series of six injections at intervals of 14 days; sometimes the larger dose of 0·02 gm. per kilo was given for one or two injections only. This treatment has been given to two categories of patients, firstly those treated previously by repeated injections of small or moderate doses of atoxyl and secondly those who had not previously been treated. Of the 102 belonging to the first class 89 have not relapsed after an interval of 14 to 17 months. Of the 84 patients belonging to the second class 21 had been observed for 14–16 months after treatment, 41 for 12–13 months and 22 for 7–12 months. Only 5 have relapsed—3 in the sixth month and 2 in the tenth to twelfth months.

The remainder of the paper is concerned with an enquiry whether the method of administration of a series of large doses of atoxyl is followed by any deleterious action. In a table it is shown that the treatment does not in early cases of the disease provoke any meningeal reaction. Amaurosis was not observed in early cases of the disease and only very occasionally when the doses were given at too short intervals or were too large. The treatment had no ill-effect on the general health of the patients and they all gained in weight.

W. Y.

LEFROU. **Essais de traitement de la maladie du sommeil à la deuxième période. Les principles directeurs—résultats de leur application.**—*Ann. Inst. Pasteur.* 1923. Mar. Vol. 37. No. 3. pp. 294–321. With 1 text fig. [6 refs.]

In this paper the author enunciates the following principles :—

1. Patients previously untreated and in the second stage of the disease should not be given very large doses of atoxyl, *i.e.*, between 0·0175 gm. and 0·02 gm. per kilo. Some 59 cases in the second stage of the disease showing meningeal reaction were treated by six weekly injections of atoxyl. In 23 of these cases large doses of the drug were given and in 36 doses of moderate size. During an observation period of six months deaths were noted only among the 23 treated by large doses.

2. A series of injections of atoxyl or of neosalvarsan produces as an immediate result a diminution of the lymphocytosis in the cerebrospinal fluid and a slight modification of the quantity of albumen, and these changes generally coincide with clinical amelioration. In a considerable series of cases the condition of the cerebrospinal fluid was noted before treatment and a week after the end of treatment, and also in 26 cases 1½ to 4 months later.

The observations are recorded in two tables, the first dealing with previously untreated and the second with previously treated cases. As a control a further table is given showing the condition of the cerebrospinal fluid at similar intervals in a dozen cases in which treatment was withheld. In still another table the influence on the cerebrospinal fluid of a single injection of atoxyl varying from 0·5 gm. to 1·1 gm. is shown in 10 patients. In 5 of these it was found that a single injection decreased the meningeal reaction, in 2 the condition was unchanged, whilst in 3 it was increased.

3. The amelioration of the meningeal reaction and of the clinical symptoms produced by injections of atoxyl or neosalvarsan is quite temporary; the lymphocytosis and albumen increase more or less rapidly and the disease runs its course.

In a table observations are summarized on 28 patients who were subjected to a lumbar puncture before treatment and also at a varying time after the last injection, and to these can be added the 26 observations set forth in the previous tables made on patients who submitted to a lumbar puncture, not only before and immediately after treatment, but also some months later.

It appears from this work that the result obtained under the immediate influence of treatment becomes lost as time goes on. Thus, the meningeal reaction which a week after treatment is found to be increased in only 6 per cent. of cases becomes later modified as follows :—In a month and a half to two months later it is found to be increased in 46·9 per cent. of cases, in three months in 55·5 per cent. of cases, and finally in four to five months in 66·6 per cent. of cases.

4. Injections of emetic do not diminish the meningeal reaction, but on the contrary show a tendency to increase it. Evidence in support of this is shown in a table relating to six patients who received either six injections of emetic or only a single injection.

In view of these principles it appears that the rational therapy of sleeping sickness in the second stage ought to aim at gradually diminishing the meningeal reaction by a series of injections of atoxyl, or of neosalvarsan, given at such intervals that the meningeal reaction never regains its previous intensity. The cases in the second period should be divided into two categories: (*a*) those with trypanosomes in the glands or in the blood, and (*b*) those in which the peripheral circulation is sterile. Class (*a*) should be given a series of injections of atoxyl-emetic, or of atoxyl alone, in order to sterilize the peripheral circulation. Large doses of atoxyl should be avoided and if emetic is used it should be given in the classical doses. A series of injections of atoxyl should be repeated at intervals of two months. Class (*b*) should be treated only by a series of injections of atoxyl at intervals of two months. Fifty-two patients were thus treated, and the results, after an observation period of 9–12 months, are given in a table. Of the 30 new (previously untreated) cases, 24 are living, 4 are dead and 2 are blind. Of the 22 old (previously treated) cases, 16 are alive, 4 are dead and 2 are blind.

The author discusses at some length the cause of blindness and of death in the above cases and also gives information regarding the condition of some of those who are still living.

W. Y.

CHESTERMAN (Clement C.). **Tryparsamide in Sleeping Sickness. A Study of Forty Cases, with Special Reference to the Cerebrospinal Fluid.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. pp. 394–408. [7 refs.]

The observations recorded in this paper were made at Yakusu' near Stanleyville, Belgian Congo. The author received a quantity of tryparsamide from Dr. Louise PEARCE [this *Bulletin*, Vol. 19, p. 136], with the object of testing the results of repeated administration of large doses at weekly intervals by the intravenous route, special attention being given to the cell count of the cerebrospinal fluid in the most advanced cases.

The 40 cases treated were chosen from among the 300 diagnosed during the period, because (1) the source of their infection was known; (2) they showed definite symptoms of nervous involvement and altered cerebrospinal fluid; and (3) they consented to remain in hospital in an area where reinfection could be excluded. A 30 per cent. solution of the drug was made in boiled rainwater; a course of eight weekly injections was regarded as normal, but sometimes this had to be varied because of visual disturbance, when the dose or frequency, or both, had to be changed according to circumstances. The cerebrospinal fluid was observed before treatment and at intervals varying from 1–17 weeks after treatment. The results are summarized in three tables, the first giving the record of 24 cases which had received no previous treatment; the second the results obtained in 10 patients who had previously received varying amounts of atoxyl, soamin, tartar emetic, stibenyl, or combinations thereof, without any great or permanent benefit; and the third a record of six cases first treated by the intrathecal serum method of MARSHALL and VASSALLO [this *Bulletin*, Vol. 18, p. 155; Vol. 19, p. 141; and Vol. 20, p. 331]. All these serum cases relapsed and the effects of tryparsamide on the four who survived is shown.

The following are the conclusions:—

"These are based on the intravenous administration of tryparsamide, although there is good reason to believe that the intramuscular route is not less efficacious.

"(1) The maximum tolerated dose (which should not exceed 4 grammes per week for the full-sized adult), if given regularly for a period of about eight weeks is capable of completely removing trypanosomes from, and rendering within the normal, the cell content of the cerebrospinal fluid of even the most advanced cases.

"(2) This change in the cerebrospinal fluid is accompanied *pari passu* by a very marked clinical improvement, which has so far been observed to have been fully maintained for periods not exceeding eleven months, the longest time which has elapsed up to date since treatment.

"(3) It is possible to estimate the maximum tolerated weekly dose from a consideration of the clinical condition and cell content of the cerebrospinal fluid of the patient, so that these results can be obtained without danger of producing any appreciable degree of visual disturbance.

"(4) Improvement is hardly less marked in cases which have previously resisted treatment by other arsenical drugs.

"(5) The intravenous method of administration is superior to that of intrathecal serum therapy."

W. Y.

VOEGTLIN (Carl), SMITH (M. I.), DYER (Helen) & THOMPSON (J. W.). **Penetration of Arsenic into the Cerebro-spinal Fluid, with Particular Reference to the Treatment of Protozoal Infections of the Central Nervous System.**—*Public Health Rep.* 1923. May 11. Vol. 38. No. 19. pp. 1003–1021. With 9 charts. [10 refs.]

The experiments described in this paper were conducted with the object of re-investigating the question of the penetration of various forms of arsenic into the cerebrospinal fluid and the central nervous system. The experiments were of two kinds: firstly, chemical, dealing with the study of the rate of disappearance of arsenic from the blood, the arsenic content of the cerebrospinal fluid and the arsenic content of the brain tissue; and secondly, biological, dealing with the parasiticidal effect obtainable from intravenous injections of various arsenicals on parasites which had been previously injected into the cerebral subarachnoid space. The biological method was elaborated by Smith and Voegtlin in 1921.* It was found that if a heavy suspension of *T. equiperdum* is injected into the cranial subarachnoid space of the rabbit the parasites will survive and be demonstrable in considerable numbers in the cerebrospinal fluid for at least 48–72 hours. The period of sojourn of the majority of trypanosomes in the cerebrospinal fluid was deemed sufficiently long to permit a study of the comparative permeability of the meninges for the various arsenicals, as determined by their relative trypanocidal action in the subarachnoid space.

---

* *Jl. Pharmacol. and Experimental Therapy*, xvii, p. 342.

Details are given of the technique adopted.

The drugs first investigated were arsphenamine (alkaline solution) and neoarsphenamine. These two drugs appear to penetrate into the cerebrospinal fluid with considerable difficulty. In a table the trypanocidal effect of intravenous medication on *T. equiperdum* in the cerebrospinal fluid in rabbits is given ; in this table the efficiency of the following drugs is compared :—tryparsamide, sulpharsphenamine, 3-amino-4-oxyphenyl arsonic acid, arsacetin, atoxyl, neoarsphenamine, arsphenamine, silver arsphenamine, " arsenoxide," $CH_3AsO(ONa)_2$.

With reference to the results obtained in the chemical analysis of the cerebrospinal fluid and brain for the presence of arsenic after intravenous treatment of normal rabbits, the data include only findings up to six hours after the time of injection. This period was deemed sufficiently long in view of the fact that about five times the ordinary therapeutic dose was injected and therefore it could reasonably be expected that sufficient arsenic would penetrate into the central nervous system for purposes of establishing the order of magnitude of this penetration. The above mentioned drugs were employed in these experiments and the results set forth in tables and graphs.

The conclusions are as follows :—

" 1. The penetration of arsenic into the cerebrospinal fluid, following the intravenous injection of a variety of arsenicals, has been studied by (*a*) the chemical analysis of the blood, brain, and cerebrospinal fluid for the presence of arsenic, and (*b*) the parasiticidal action obtainable in the cerebrospinal fluid.

" 2. A biological method for the study of the permeability of the meninges for various arsenicals is described.

" 3. From the therapeutic standpoint, the results obtained by means of the biological method possess greater significance than the data secured by chemical analysis, as the former method actually determined the parasiticidal effect of the arsenic which had found its way into the cerebrospinal fluid.

" 4. Arsphenamine, neoarsphenamine, silver arsphenamine, and some other compounds have a relatively low effectiveness, unless very large doses are used.

" 5. Sulpharsphenamine is the most effective arsenobenzene derivative studied, and compares favourably with the highly effective aromatic pentavalent arsenicals, which appear to possess much greater therapeutic power than the well known arsphenamines.

" 6. A greater therapeutic effect can be expected from large single doses, given at longer intervals, than from smaller doses administered more frequently.

" 7. It is pointed out that the failure to obtain a complete sterilization of syphilitic patients in more advanced stages is probably due to the deficient penetrative power of arsphenamine, neoarsphenamine, and silver arsphenamine.

" 8. Sulpharsphenamine, tryparsamid, and 3-amino-4-oxyphenyl arsonic acid are suggested as remedies of superior penetrative power."

W. Y.

STEFFAN (P.). **Morphologische Untersuchungen ueber die Wirkung verschiedener Heilmittel auf Trypanosomen.** [Morphological Investigation into the Action of Various Drugs on Trypanosomes.]—*Ztschr. f. Hyg. u. Infektionskr.* 1922. Sept. 25. Vol. 96. No. 3. pp. 263–287. With 1 text fig. and 1 plate. [37 refs.]

For the purpose of investigating the morphological change produced in trypanosomes by various drugs, the author used mice at the height of infection with *T. equiperdum*, *T. brucei* or *T. equinum*. The drugs were (*a*) arsenic and antimony preparations (atoxyl, tartar emetic and stibenyl); (*b*) triphenylmethane dyes (parafuchsin and tryparosan); (*c*) acridin dyes (flavicid and trypaflavin); (*d*) safranin dyes (trypasafrol); (*e*) benzidine dyes (trypanrot); (*f*) "Bayer 205"; (*g*) normal human serum.

Most of the drugs examined produced a visible change in the protoplasm of the parasites. Primary protoplasmic damage was produced by atoxyl, tryparosan, flavicid, trypaflavin and trypanrot; but probably trypasafrol, "Bayer 205," and human serum also produced protoplasmic changes. The antimony preparations exhibit a specific affinity for the nucleus as in a less degree do also trypasafrol and trypanrot. Parafuchsin, tryparosan, flavicid and trypaflavin cause the blepharoplast to disappear; information is given regarding the manner in which this takes place. In some cases, especially in those of feebly active drugs, *e.g.*, parafuchsin and trypasafrol, the divisional processes were at first somewhat stimulated; on the contrary a retarding of this process, such as that described by MAYER and ZEISS, occurs after high doses of "Bayer 205" [this *Bulletin*, Vol. 17, p. 334]. In addition such changes were observed as vacuolation of the blepharoplast, inflation of the posterior end and so forth. Of the three parasites investigated *T. brucei* reacted most quickly and intensely and *T. equiperdum* most slowly.

W. Y.

ZIRONI (Amilcare). **Sulla attività dei vari arsenobenzoli nella cura della tripanosomiasi.** [The Activity of the Various Arsenobenzols in the Treatment of Trypanosomiasis.]—*Terapia.* Milan. 1923. Mar. 1. Vol. 13. No. 48. pp. 14–26.

In these experiments mice, rats, rabbits, dogs and guinea-pigs infected with *T. brucei* were used. It was found that novarsenobillon and sulfarsenol exerted only slight trypanocidal activity and did not cause the disappearance of parasites from the circulation. "Sanar" and "914" exhibited considerable activity, but the best results were obtained with Neoiacol, a new Italian preparation. Subcutaneous injections proved to be more efficacious than intravenous. Details of the various experiments performed are given in a series of tables.

W. Y.

SEI (Shigemoto). **Ueber den Einfluss von "Bayer 205" auf das Blut.** [The Influence of "Bayer 205" on the Blood.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 4. pp. 130–142. [7 refs.]

The following summary is given:—

The investigations which were conducted on healthy rabbits showed that administration of "Bayer 205" resulted in:—

1. A decrease in the number of red corpuscles, which was most marked some days after treatment.

2. A decrease in the haemoglobin content, which was likewise most marked some days after treatment.
3. The appearance of numerous nucleated red cells.
4. No appreciable influence on the number of leucocytes.
5. In one animal, 2–4 days after treatment, there was a slight polynuclear increase and a corresponding decrease of lymphocytes; this was followed on the sixth day by a slight fall in the polynuclears and increase in the lymphocytes. Morphologically there was evidence of considerable damage to the polynuclear leucocytes.
6. The rate of sedimentation of the erythrocytes (as tested by Linzemeier's method) was greatly accelerated.
7. The complement content of guinea-pigs' blood was not reduced by treatment with " Bayer 205."

W. Y.

LUENGO (E.) & DE BUEN (S.). **Poder tripanolitico del suero de un enfermo tratado por el " Bayer 205."** [The Trypanolytic Property of the Serum of a Patient after Treatment with " Bayer 205."]—Reprinted from *Bol. Soc. Española de Biol.* 1922. Vol. 10. No. 1. 5 pp.

Four series of experiments were carried out with the serum of a patient who had received in all 8 gm. of " Bayer 205." In the first, 0·2 cc. of the serum with 0·05 cc. of the blood of a guinea-pig heavily infected with trypanosomes from the same patient was inoculated into the peritoneal cavity of a white rat. In 15 minutes marked trypanolysis took place. In a second series, to test the minimum trypanolytic dose, the effect was found to be very definite with 0·05 cc., very slight with 0·025 cc., though the "incubation" was prolonged. A third series was devised to test whether the effect was due to the serum itself or to the presence of the drug in the serum. The serum of a treated patient showed marked trypanolysis, whereas normal serum *plus* " Bayer 205 " in proportion of 0·005 gm. per cc. showed none. Lastly, such serum was found to possess an agglutinative power on the trypanosomes and the trypanolytic action was seen to be largely specific; on other strains the effects were but slight.

H. Harold Scott.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **La méthode de " Marshall " dans le traitement de la trypanosomiase humaine.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 25–35. [7 refs.]

Referring to MARSHALL's intrathecal method of treatment in sleeping sickness [this *Bulletin*, Vol. 19, p. 141, and Vol. 20, p. 331], the authors state that it appears to them that MARSHALL and VASSALLO would have obtained equally good results if they had refrained from giving the intrathecal injection and had administered only the intravenous injection of salvarsan. Details are given of two cases observed by the authors; the first was given a single dose of 0·20 gm. of cupric salvarsan on July 22, 1913, and was still well and apparently free from parasites in December, 1921; the second was given a single injection of 0·75 gm. of neosalvarsan on January 9, 1914, and was still well five years later.

A series of 14 cases in various stages of the disease were treated by MARSHALL's method ; details of each case are given. Of the 12 cases injected intraspinally with salvarsanized serum 10 relapsed with parasites in their blood in from 3–4 weeks ; in the other two, parasites have not reappeared in the blood, but the general condition has deteriorated. In two patients treated by intraspinal injection of their own serum only trypanosomes did not disappear from their blood.

The conclusions are :—

1. Marshall's method is not even original ; long ago it was abandoned in the treatment of human trypanosomiasis.
2. Salvarsanized serum is not an irritant for the spinal canal.
3. Intrathecal injection of salvarsanized serum has no trypanolytic action. The peripheral sterilization obtained by the method must be attributed to the previous injection of salvarsan.
4. Intrathecal injection of blood serum has no curative action ; it does not even produce a temporary peripheral sterilization.
5. Intrathecal injection of the serum of a chronic case, which has been treated successfully, has no curative action on another case ; it does not even produce temporary sterilization.
6. Intrathecal injection of serum removed after previous injection of atoxyl, soamin, silver-salvarsan, galyl and tryparsamide likewise has no curative effect and is followed by only a temporary sterilization, which is due to the initial injection of the drug.

W. Y.

CROWELL (Bowman Corning). *Trypanosoma cruzi* **in the Tissues of the Armadillo.**—*Jl. Amer. Med. Assoc.* 1923. Mar. 31. Vol. 80. No. 13. pp. 910–912. With 3 text figs.

A microscopic examination was made of the tissues of an armadillo, naturally infected with *T. cruzi*, captured at Lassance, the centre of the endemic zone of Chagas' disease. Examination of the heart showed lesions of the myocardium and parasitization of the cardiac muscle fibres. An interesting finding was the presence of a parasitic thrombus in a small artery in the myocardium, the thrombus being literally filled with *T. cruzi*. The apex of the heart was free from lesions and parasites, but sections from the region of the auriculo-ventricular sulcus showed a marked infiltration of mononuclear cells and parasitized muscle fibres.

W. Y.

PINTO (Cesar). **O** *Triatoma brasiliensis* **Neiva transmitte o** *Trypanosoma cruzi* **Chagas.**—*Brazil-Medico.* 1923. Feb. 10. Year 37. Vol. I. No. 6. p. 73.

At the end of 1922, examples of *Triatoma brasiliensis* were received at the Institute of Oswaldo Cruz from Quixada (State of Ceará) ; these bugs, which were found to be infected with *T. cruzi*, have been recorded from the States of Rio Grande do Norte, Ceará, Piauhy, Bahia and Minas Geraes.

W. Y.

BATTAGLIA (Mario). **Encephalitis bei experimenteller Trypanosomiasis.** —*Cent. f. Bakt.* I. Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. pp. 94–96.

This work is a continuation of that already recorded [this *Bulletin*, Vol. 19, p. 147].

In sections of brain of animals which had died of various trypanosome infections (*T. battaglia, T. lewisi, T. brucei, T. dromedarii* and *T. gambiense*) rounded bodies were found either within or around the nerve cells. These bodies, which were arranged like diplococci, or cross-wise, or in groups, were biscuit-shaped, club-shaped, or rod-shaped, and reminded one of the Negri bodies seen in rabies and distemper. They have sharp round contours and were found scattered through the entire central nervous system. The author considers that this finding is constant in all infections of the central nervous system characterized by hyperaemia and lymphoid infiltrations and by definite lesions of the nervous tissue.

Clinically, animals suffering from trypanosomiasis, distemper or rabies, and man with sleeping sickness, cerebral syphilis and encephalitis lethargica, exhibit analogous symptoms due to alterations in the central nervous system. The pathological lesions in these infections are more or less similar and show a severe damage not only of the vessels and connective tissue, but also of the cytoplasm and nuclei of the nerve cells. The cell body exhibits various changes in form and reaction to dyes reminding one of well-known micro-organisms. These appearances, although sometimes of diagnostic value as in rabies, have nothing to do with the evolution or involution phases of the parasites causing the disease.

W. Y.

ROSENTHAL (F.) & FREUND (R.). **Weitere Untersuchungen ueber die trypanoziden Substanzen des menschlichen Serums.** [Further Investigations on the Trypanocidal Substances in Human Serum.] —*Klin. Woch.* 1923. Apr. 30. Vol. 2. No. 18. p. 836, and *Ztschr. f. Immunitätsf. u. Experim. Therap.* I. Teil. Orig. 1923. June 22. Vol. 37. No. 1/2. pp. 48–76. [17 refs.]

These two papers deal with the same matter, the former being a brief summary of the work recorded in detail in the latter paper. They form a continuation of the work already recorded on this subject [this *Bulletin*, Vol. 19, pp. 154 and 520, and Vol. 20, p. 337].

The conclusions are as follows :—

1. The liver is to be regarded as the chief seat of formation of the trypanocidal substances (or their precursors) in human serum.

2. These substances are to be found in the euglobulin—and pseudoglobulin—fraction and have nothing to do with the fibrinoglobulin and albumen fractions.

3. Immunization with active trypanocidal human serum does not result in the production in rabbits and mice of specific antibodies against the trypanocidal substance. The trypanocidal substance in human serum has then no antigen property. Neither specific precipitation nor contact with foreign serum suffices to produce any perceptible decrease in the trypanocidal property.

4. The repeated injection of large quantities of active human serum inhibits the protective action of a dose administered after an interval. This phenomenon of inhibition of trypanocidal serum has a specific character.

5. The phenomenon of inhibition of serum trypanocidal action in previously treated animals is not the result of the formation of anti-trypanocidal bodies. It is not a true immunity process, but represents

on the contrary an exhausting phenomenon of the treated animal whereby the production ceases of a body which has the power of forming trypanocidal substances out of the injected human serum.

6. Human serum does not contain trypanocidal substances but only trypanocidogenous bodies, which are at first inactive. On the introduction of the human serum into the animal organism a substance (ferment) is called into action which changes the trypanocidogenous bodies into trypanocidal bodies.

7. It appears from this still doubtful whether the trypanocidal property of human serum plays any important part in the natural immunity of man to the trypanosomes of animals.

W. Y.

SAVINI (Emile). **Infection trypano-spirochétique.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 956–958.

On four occasions out of 62 passages of *T. brucei* through mice, spirochaetes turned up spontaneously in the mouse's blood. On the seventh and eighth days the trypanosomes and spirochaetes were almost as numerous as the red cells and the animals died on the tenth and eleventh days. Spirochaetes were found not only in the blood, but in all the organs and in the intestine; they were 10–20μ long, with 5–12 spirals; the extremities were effilate. The author believes that nagana sensitizes the organism for the reception of the second infection. The spirochaetes are non-pathogenic; all attempts to culture them were in vain, as likewise were attempts to carry on the strain by inoculation and cause the spirochaetes to invade the blood from the intestine. In this connection the author refers to the spirochaetes found by BLIECK (1913) shortly before death in the blood of a calf inoculated with piroplasma and to the various spirochaetes found in the blood and organs of man in various diseases, *e.g.*, blackwater fever.

W. Y.

i. SLAVOACA (Titus). **Contribution à l'étude du mécanisme de l'action de l'atoxyl dans la trypanosomiase des souris.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 927–929.

ii. ——. **Relation entre la dose thérapeutique du salvarsan et le degré de l'infection dans la trypanosomiase des souris.**—*Ibidem.* pp. 939–941. [2 refs.]

i. As the result of experiments on mice infected with nagana, the author concludes that the action of atoxyl is direct and the intervention of the organism of the mouse is not necessary for the production of the active substance; apparently the parasites are able to reduce the drug in their own bodies and to transform it in active substances.

ii. In these experiments the author used mice infected with a strain of *T. brucei*, which killed them in three days. He made three series of observations, each consisting of five mice. Four of the animals in each series received respectively 0·02 mgm., 0·04 mgm., 0·06 mgm., and 0·08 mgm. of salvarsan, the fifth animal being in each case used as a control. The animals of the first series were treated one hour after infection, those in the second series on the following day, and those in the third series on the third day. The results showed that the further the infection is advanced the less the quantity of drug required to give rise to a cure.

W. Y.

i. MAYER (Martin). **Bemerkung zu der Arbeit von Karl** [*sic*] **Hesselbach: Die trypanozide Wirkung von "Bayer 205" auf** *Trypanosoma equiperdum.* **Bd. 89. H. 4/5. S. 48 dieser Zeitschrift.** [Remarks on the Work of K. Hesselbach: the Trypanocidal Action of "Bayer 205" on *T. equiperdum.*]—*Cent. f. Bakt.* I. Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. p. 96.

HESSELBACH (Kurt). **Entgegnung auf die Bemerkung von Prof. Martin Mayer zu der Arbeit von Kurt Hesselbach: Die trypanozide Wirkung von "Bayer 205" auf** *Trypanosoma equiperdum.* **Bd. 89. H. 4/5. S. 48 dieser Zeitschrift.**—*Ibid.* May 4. No. 4. p. 271.

ii. LOW (George C.) & MANSON-BAHR (Philip), with others. **The Treatment of Human Trypanosomiasis by "Bayer 205."**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. pp. 339–393. With 1 plate. [57 refs.]

iii. CHEINISSE (L.). **Deux nouveaux agents trypanocides.**—*Presse Méd.* 1923. Jan. 27. Vol. 31. No. 8. pp. 81–83. [14 refs.].

iv. VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Trypanoléine van Saceghem dans la trypanosomiase humaine.**—*C.R. Soc. Biol.* 1923. Mar. 10. Vol. 88. No. 9. pp. 627–629. [2 refs.]

i. Mayer complains that HESSELBACH [this *Bulletin*, Vol. 20, p. 325] does not refer adequately to the previous work of MAYER & ZEISS or to that of HAENDEL and JOETTEN [this *Bulletin*, Vol. 17, pp. 333 & 334].

Hesselbach replies.

ii. This paper deals with the same observations as those recorded in a previous article [this *Bulletin*, Vol. 20, p. 323].

iii. A general account of some therapeutic observations made on tryparsamide and "Bayer 205." Nothing new.

iv. The diagnostic value of the trypanoléine test of VAN SACEGHEM [*Trop. Vet. Bulletin*, Vol. 11, p. 44] was examined in six cases of human trypanosomiasis, the conclusion reached being that the test was of no practical value.

W. Y.

Erratum.

Bulletin, 1923, No. 4, p. 317. Commenting on a paper by MACKENZIE, who recorded an acute case of Rhodesian sleeping sickness in which the patient developed interstitial keratitis, the reviewer remarked that this symptom had not been observed before in human trypanosomiasis. This is incorrect. Interstitial keratitis appears to be not rare in Nyasaland [HEARSEY; SHIRCORE, this *Bulletin*, Vol. 1, pp. 279 & 656], and has been observed in Senegal by THIROUX and D'ANFREVILLE [*loc. cit.*, p. 279, footnote] in a case in which the trypanosome was believed to be *gambiense.*

W. Y.

PEARCE (Louise). **Intrathecal Injections of Tryparsamide.** [Correspondence.]—*Brit. Med. Jl.* 1923. May 19. p. 883.

SHARP (N. A. Dyce). **The Dose of Bayer "205."** [Correspondence.]—*Lancet.* 1923. May 19. p. 1026.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

HAGE. **Nachuntersuchungen bei Amöbenruhr.** [Further Investigations in Amoebic Dysentery.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 3. pp. 93–109. [26 refs.]

These investigations were made upon the personnel of the much-reduced German navy and classified under three headings :—

1. Those who had undoubtedly suffered from amoebic dysentery.
2. Those who had suffered from "clinical dysentery" in countries where amoebiasis is known to occur.
3. Those who, while suffering from dysentery, cause unknown, had been in contact with true sufferers from amoebic dysentery.
4. Those who had resided in countries where amoebic dysentery is common, but had not suffered from "dysentery."

In all 96 were examined, the faeces being examined fresh and stained, with a few exceptions, on five or six days, possibly spread over several weeks. Of 23 of the first group, 19 were found to be passing either the active forms or cysts of *E. histolytica.* The number of parasites varied enormously from day to day. Two cases suffered from hepatic abscess to which they eventually succumbed. One man, a prisoner of war in Russia, appeared to have contracted his infection from drinking water on the Amur, near Lake Baikal. Energetic treatment with emetine during the acute stage appeared in no way to minimize the liability of the patient to become a cyst carrier.

In the second group, out of 23 examined, 7 were found to be cyst passers, and all had suffered from severe clinical dysentery.

In the third group are included three cases who contracted amoebic dysentery while serving in France and Belgium.

The fourth group contained 47 cases of which 8 (17 per cent.) were found to be carriers of *E. histolytica* cysts.

P. H. Manson-Bahr.

GAEHLINGER. **Épreuve biliare par la cure de Chatelguyon pour le diagnostic et le traitement de la dysenterie amibienne.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 100–103.

The microscopic diagnosis of amoebic dysentery is often difficult, or even impossible, on account of the scarcity of the parasites. The administration of biliary extracts to the patient provokes a benign attack and renders the detection of the parasites more easy. Chatelguyon water by stimulating the secretory apparatus has the same effect.

Four observations to this effect were made on as many resistant cases of amoebic dysentery. Cysts and entamoebae soon appeared in the faeces and all were subsequently cured with emetine or novarsenobenzol.

The author concludes that this water, which contains chloride of magnesia, has an effect not only in provoking a mild exacerbation of the disease, but also in assisting in the cure. The cicatrization of the bowel is aided by injection of the water, drop by drop, into the rectum.

P. H. M-B.

FIDAO (G.). **Forme fruste d'amibiase hépatique primitive.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 241–243. [1 ref.]

Obscure primary cases of hepatitis have occurred in the author's practice. The patients have a pallid look, are emaciated, weak, and extremely easily fatigued, liable to dyspnoea and to sudden profuse sweats and broken sleep. Malaria was naturally suspected, but in seven no parasites were found and the condition of the others was not alleviated by quinine. The intestinal functions were normal; no diarrhoea or dysentery. Two had been in Belgian Congo only six or seven months. One had an acute attack of hepatitis terminating in amoebic liver abscess. On a course of emetine injections, each consisting of 0·12 gm. of emetine hydrochloride, given twice daily, they all made a remarkable recovery. The author therefore considers these obscure cases of hepatitis to have been amoebic in origin.

P. H. M-B.

HEYMANN. **De l'exploration radiologique du foie après insufflation d'air dans le péritoine. Diagnostic d'abcès du foie par Pneumo-péritoine. (Annex au Rapport du Dr. Le Roy des Barres.)**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 86–89. With 3 plates. [10 refs.]

A successful radioscopic diagnosis of liver abscess depends upon the assemblage of a number of signs—most of which are remote signs due to the swelling of the liver itself; seldom can a shadow of the abscess be obtained. A large number of cases cannot be diagnosed by the X-rays.

The difficulties in radioscopy of the liver are due to anatomical peculiarities. The lower border and the left lobe, in spite of artificial aids (gaseous dilatation of the stomach and rectal injections), are very difficult to define. The shadow of the diaphragmatic muscle is apt to be confused with the outline of the liver itself. A normal liver will give a dense shadow about the centre for certain physical reasons.

After insufflation of the peritoneal cavity with air the liver becomes remarkably apparent and its borders well-defined.

Insufflation is extremely simple; the apparatus consists of a lumbar puncture needle mounted on an india-rubber tube. The intestine should be emptied and an injection of morphia is a necessary preliminary. Usually, the gas is completely absorbed within 24 hours.

A case is cited in which an opacity in the liver in a radiograph obtained by the pneumo-peritoneal method indicated a small abscess in the lower portion of the right lobe and this was proved at operation to be correct.

The author is of the opinion that this is the only radiographic method with which the diagnosis of liver abscess can be made with certainty. Ten references are appended.

P. H. M-B.

MORIN (Jean). **Contribution à l'étude de l'hépatite amibienne.**—*Rev. Méd. de la Suisse Romande.* 1922. Apr. Vol. 42. pp. 235–242. With 1 chart.

Amoebic dysentery, with its associated hepatic and pulmonary complications, is of sufficient rarity in Switzerland to be worthy of notice when it occurs. The observations here recorded were made on interned prisoners of war.

The protocols of one case are given at great length and demonstrate amply the difficulty of making a diagnosis, especially in countries where amoebiasis is a rarity. Here, for instance, provisional diagnoses of tuberculosis, malaria and pyelitis were made.

No assistance was derived from an X-ray examination, there was no dysenteric history, the stools did not contain entamoebae or cysts. The negative results of special hepatic efficiency tests (" haemoclasic crisis " of WIDAL) did not at first lead the various consultants to suspect the liver to be the seat of suppuration. The marvellous therapeutic action of emetine given on purely empirical grounds clinched the diagnosis.

P. H. M-B.

ESCOMEL (Edmundo). **Veinticinco casos de hepatitis supurada, curados sin operación, por las inyecciones de emetina.** [Twenty-five Cases of Suppurative Hepatitis cured by Injections of Emetine.]—*Cronica Méd.* 1923. Mar. Vol. 40. No. 717. pp. 85–94.

Only a small portion of this paper deals directly with the subject of liver abscess. In none of the 25 cases was puncture or incision employed. The author injects 2 cgm. of emetine with an equal quantity of sparteine (to counteract any cardiac depressant effect of the emetine) in 2 cc. of distilled water daily. The number of injections varied between 10 and 20. For hepatitis following rapidly on dysentery 12 are needed ; for a small abscess 20 ; for a large abscess 30. The emetine acts, in dysentery, partly by its toxic action on the entamoeba and partly by its haemostatic action depriving the parasite of its chief nutriment, blood. According to the author, it is not the cysts that are infective, but the entamoeba which encysts on coming in contact with the gastric juice, passes on to the large intestine, is there transformed into the free amoeba again, sets up dysentery and passes by the haemorrhoidal veins to the liver.

H. Harold Scott.

MANSON-BAHR (Philip), LOW (George C.), PRATT (J. J.) & GREGG (A. L.). **The Treatment of Liver Abscess by Aspiration, with an Account of Fifteen Cases.**—*Lancet.* 1923. May 12. pp. 941–945. [26 refs.]

Operations performed for the relief of amoebic abscess of the liver have hitherto been regarded as in every case serious enough to warrant a guarded and even a grave prognosis. The open operation of former days resulted in a mortality varying from 30 to 50 per cent. Treatment by aspiration was suggested nearly a century ago, and in 1884 the mortality recorded by TOMES was more than double that following the open method.

During the last twenty years there has been an ever-increasing number of advocates for aspiration combined with medicinal treatment. The pioneer was Sir Leonard ROGERS, who in 1902 suggested injection of quinine into the evacuated abscess cavity ; later, emetine hydrochloride was employed in place of quinine.

The present paper records the excellent results of aspiration combined with a course of emetine subcutaneously, and emetine bismuth iodide by the mouth with a view to removing the source of infection in the bowel. Fifteen consecutive cases are recorded in detail without a single death. Eleven of them were treated by the method specified ; and in three cases emetine, and in one case eusol, was injected into the abscess cavity, although among their conclusions the authors state that " injection of emetine into the abscess cavity is by no means essential, nor, in our opinion, advisable."

There are three great advantages to be inferred from the paper under review :—(1) that aspiration is quite a simple matter, and can be undertaken with every probability of success where a patient is obviously too ill to admit of a major (open) operation ; (2) the patient is not necessarily subjected to the ordeal and dread of a general anaesthetic ; (3) the stay in hospital is much shorter than with previous methods ; the average of this series of fifteen was less than a month, in one case eleven days only.

[The authors are to be congratulated upon their paper and the successes described. Reports of further cases will be awaited with interest in order that fuller comparisons with other records may be made, for TALBOT, in 1919, performed "successful aspiration in eleven cases, with no deaths, in Mesopotamia," presumably without medicinal treatment.]

H. Harold Scott.

LUDLOW (A. I.). **Liver Abscess. Report of One Hundred Operations.** —*Surgery, Gynecology & Obstetrics.* 1923. Mar. Vol. 36. No. 3. pp. 336–343. With 4 figs. [10 refs.]

This ranges over the same gound as the paper reviewed in this *Bulletin*, Vol. 17, p. 8.

All the patients were Koreans ; none were Europeans or Americans, although amoebic dysentery is of common occurrence amongst them ; their freedom is attributed to early and energetic treatment with emetine.

In the series the age ranged from 7 to 50 years ; there were two boys of 7 and 10 and only eight females, the highest percentage yet recorded. Apparently the great majority of the males were addicted to alcohol. Amoebic dysentery is frequent in the locality and *E. histolytica* was found "in 10 per cent. of the 50 cases in which faecal examination was made."

All the abscesses in individual lobes were single or easily converted into single abscesses ; they varied from 4 cm. in diameter to that of nearly the entire lobe. Those which had ruptured contained 3 litres of dark red pus, at times foul in odour. In 93 cases the abscess was situated in the right lobe only, in 2 in the left and in 5 in both.

In the sputum of 7 ova of *Paragonimus westermanii* were found, and in 2 tubercle bacilli. Rupture into the pleural cavity occurred in 9 cases, through the chest wall once ; necrosis of the ribs 5 times, 2 pre- and 3 post-operative. Rupture into the abdominal cavity was noted 5 times. Albumin in the urine was found in 6 cases and ascites in 6. Many cases had no fever on admission to hospital.

Uncomplicated cases had a fairly normal blood count ; very few presented a high leucocytosis, 27,400 being the highest reported.

The symptoms presented are variable. Almost every patient gave a history of diarrhoea, chills, or sweats, at some time during the period of illness. In eight cases distinct swelling was observed in the epigastric region and in five in the right side of the abdomen. Enlargement of the liver below the costal margin could, as a rule, be detected by palpation. Deep fluctuation was obtained in ten cases. Attention is directed to one sign which is invariably present—deep-seated pain elicited by a sudden thrust with the end of the finger, usually at the ninth interspace, about 2 in. from the right costal border.

Most frequently the liver dullness is enlarged upwards, often reaching the fifth rib in the mid-axillary line and the angle of the scapula posteriorly.

The pulse, temperature and respiration may all be misleading.

Treatment by aspiration, together with the use of emetine, is now being tried. The procedure generally adopted by the author is as follows:—A preliminary treatment by subcutaneous injections of 0·06 gm. is given daily for 2–4 days, during which any intestinal parasites which are present are expelled. The aspirator is employed for diagnosis only and used in the operating theatre as a prelude to operation. The trocar is inserted under local anaesthesia, and should the patient's condition be serious it is wise to perform the operation under the same method. Incision is made parallel to the ninth rib, beginning 2 in. from the right costal margin. A portion of rib 2–3 in. in length is resected, the diaphragm incised and liver exposed. A small incision is made in its capsule and the wound enlarged by opening the scissors and drawing them out. After most of the pus has been evacuated the cavity is packed with gauze and left undisturbed for two days. The abscess is subsequently drained with rubber tube and gauze. The emetine injections are continued for four days after operation or longer if symptoms persist. The mortality in this series was 10 per cent.

P. H. M-B.

COMBIER (V.) & MURARD (J.). **A propos des grands abcès du foie ; la forme aigue de ces abcès : quelques remarques au sujet de leur traitement.**—*Presse Méd.* 1923. Apr. 28. Vol. 31. No. 34. pp. 386–388. [4 refs.]

A very acute type of liver abscess exists which the authors consider has not been sufficiently recognized, in which the process is so rapid that a seropurulent fluid forms in place of the more familiar liver abscess pus. A case is cited in which the onset was acute with very considerable hepatic and epigastric pain and the clinical picture resembled that of some acute intra-abdominal condition. The urine contained a quantity of albumin. At operation, and afterwards at the autopsy, a small gangrenous area was found on the anterior surface of the right lobe.

A second case is recorded in which under local anaesthesia the abscess cavity was opened and evacuated and the wound closed by suture. This seemed to answer admirably, for healing was firm and by first intention. Unfortunately the patient died one month afterwards, and the state of the liver was verified at autopsy.

Liver puncture should be performed more often since it is a simple operation, free from danger. Indeed, they cite cases in which 25 punctures have been made at one operation without any harmful results.

P. H. M-B.

RAMOND (Louis), DENOYELLE & LAUTMAN. **Un cas d'amibiase pulmonaire pure sans abcès du foie guéri par l'émétine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. May 10. 3rd Ser. Year 39. No. 15. pp. 655–662. With 2 figs. in text.

The case was one in which pulmonary complications were readily cured by injection of emetine, but there was no ascertainable involvement of the liver. Pulmonary amoebiasis has not been generally recognized ; it is probably rarer than hepatic abscess. The patient, an aviator who had been flying in Morocco, was troubled with constant cough, often accompanied by blood-stained expectoration. Radioscopic examination showed a definite opacity at the base of the right lung, where the percussion rate was impaired and bronchopneumonic signs were present. The sputum contained no tubercle bacilli, but abundant cellular elements, such as leucocytes and altered red cells.

The tentative diagnosis of amoebic pulmonary abscess was arrived at by consideration of the previous history of the patient, who had suffered in 1919 from an attack of amoebic dysentery followed by distinct relapses.

The pyrexia, which reached 103° F., immediately resolved after the exhibition of emetine, as is effectively illustrated by the chart. In the absence of any direct proof, *i.e.*, the presence of the *E. histolytica* in the sputum or in the faeces, the diagnosis must rest upon probability and the remarkable response to the therapeutic test. One symptom that is of value is the character of the sputum—purulent and haemorrhagic, composed of viscid mucus, and sometimes chocolate coloured, and liable to be mistaken for that of pulmonary tuberculosis.

The operative treatment of this condition is not likely to succeed ; in fact, the cases in which operation has been attempted have been generally fatal, in strong contrast to the almost miraculous action of emetine.

P. H. M-B.

WILLMORE (J. Graham). **The Treatment of Refractory Cases of Amoebic Dysentery.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 13–26. (Discussion, pp. 33–45.)

Experiences of the last two years in the Ministry of Pensions' Hospital are here set forth. All the cases were diagnosed by the discovery of *E. histolytica* in the faeces. The author's practice has been to give 10 gr. of emetine and 60 gr. of emetine-bismuth-iodide concurrently in 20 days, with the following results :—

1. Of 358 cases treated by emetine and emetine-bismuth-iodide :—	
99 were presumably cured after the first course	28 per cent.
259 relapsed	72 ,,
2. Of these 259 cases, 183 received a second course :—	
36 were presumably cured	20 ,,
147 relapsed	80 ,,
3. Of these 147 cases, 59 received a third course :—	
3 were presumably cured	5 ,,
56 relapsed	95 ,,

4. Of these 56 cases, 26 received a fourth course.
5. Of the 26 cases, 8 received a fifth.
6. Of the 8 cases, 7 received a sixth.

The incidence of relapses in categories 4, 5 and 6 was 100 per cent.

7. Of 54 cases treated by emetol and paremetol :—	
48 [? 28] were presumably cured	52 per cent.
26 relapsed	48 ,,
8. Of 91 cases treated by emetine periodide (*inter alia*) :—	
43 were presumably cured after the first course	47 ,,
48 relapsed	53 ,,
Of these 48 cases, 37 received a second course :—	
14 were presumably cured	38 ,,
23 relapsed	62 ,,
Of these 23 cases, 7 received a third course :—	
2 were presumably cured	29 ,,
5 relapsed	71 ,,

From these figures Willmore argues that neither emetine nor emetine-bismuth-iodide are specific cures for amoebiasis. Both are valuable drugs, but they do not always eradicate the infection or prevent relapses. For the incurable residue, other methods have had to be devised.

In considering the effect of various drugs on the entamoeba it is pointed out that encystment never occurs in the liver, nor can the organism exist in the vegetative state in the small intestine. Possibly encystment is due to the presence of anti-enzyme, and this substance is not elaborated in the liver. The worst cases to cure in Willmore's experience are those which pass from one acute relapse into another and are completely refractory to emetine in any form and in which encystment of *E. histolytica* does not appear to take place. In these cases, too, the disease does not affect the general health as much as one would expect; they do not develop liver abscess nor become fulminant.

The difficulty of treating the colon by medication *per os* is due to the drug having to travel 25 ft. through the digestive and absorptive tract before it can exercise its effect, which it has to do over any or every point in a section six or more feet in length; consequently it has seemed desirable, especially if the treatment is controlled by sigmoidoscopy, to supplement medication *per os* by medication *per rectum.*

To a solution of emetine base, 1 gr. in 2 drachms of olive oil, are added 4–6 drachms of ether and another 8 oz. of olive oil, and the whole, after a preliminary washout, is injected slowly into the bowel, the patient being retained, by the aid of bed-blocks and pillows, in as "inverted" a position as possible. These injections are usually given every other day, 6–12 completing a course, the good effects of which, in the areas which the enema can reach, are confirmed by sigmoidoscopy. A larger enema is not well tolerated.

Ipecacuanha—in bolus or cachets, in membroids, or in intensive doses of 30–45 gr. daily, or in smaller doses for months—and alcresta have proved to be less effective than emetine or emetine-bismuth-iodide. Ravaut's paste is undoubtedly a useful adjunct in most cases, but has no real curative value. The same may be said of simaruba and pomegranate. Decoction of Kûrchi bark is now being tried. It does not eradicate the infection, but seems to keep the entamoebae under control. A solution of emetine oleate in liquid paraffin, 1 gr. to 2 drachms, termed paremetol had to be discontinued on account of its nauseating qualities.

Emetine periodide prepared by MARTINDALE has received an exhaustive trial. It is a dark purple, crystalline powder insoluble in physiological acids, but split up with liberation of emetine by a 2 per cent. sodium carbonate solution. It is possible that the bulk of contained emetine (38·7 per cent.) is liberated by the action of the bile and other alkaline secretions.

The present practice consists in giving :—Emetine hydrochloride 1 gr. intramuscularly, and 1 gr. of emetine base in ether-olive oil *per rectum* ; each for six days on alternate days. Concurrently, 2 gr. of emetine periodide are given *per os* three times daily for 15 days with 5 gr. of *fel bovinum* t.d.s. in separate capsules.

So far, emetine periodide appears to be by far the most effective, and the least toxic, of all the emetine preparations tried. It will probably supersede emetine-bismuth-iodide just as ether-emetol may supplement intramuscular emetine, except for amoebic hepatitis, when the latter method is effective. E.P.I. (emetine periodide) may be given as an intensive course of 90 gr. in a short period of 15 days, and this may be repeated after 10 days interval. From the patient's point of view there are many advantages—the absence of nausea, vomiting, depression and weakness, which attended the use of E.B.I. No cardiac dilatation, no emetine rash, desquamation or neuritis has followed the administration of 120 gr. in 20 days. It seems to be as effective as emetine-bismuth-iodide, though, as it has been tested for less than one year, it is premature to offer any opinion as to the permanency of the cure. The cases so far treated successfully had proved refractory to all the known standard methods of anti-amoebic treatment.

The diagnosis, treatment and prognosis of all cases of *E. histolytica* infection should be controlled by clinical and sigmoidoscopic examinations ; scrapings should be taken from the yellow submucous points and examined fresh under the microscope. The examination should be performed without an anaesthetic and the instrument be guided by eye. It is encouraging to watch the healing of amoebic ulcers, but dangerous to rely entirely on these findings in making a prognosis. If the caecum be left infected, the infection appears to trickle down the bowel.

If any benefit is to accrue from treatment, it will be quickly apparent. Emetine in any form is a poisonous drug and care is always necessary in its administration.

P. H. M-B.

MARTINDALE (W. H.). **A Note on Emetine Preparations for Rectal and Oral Use.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 27–32. (Discussion, pp. 33–45.)

WILLMORE suggested to Martindale to combine the alkaloidal base —emetine—with one of the fatty acids, such as the oleate, for administration as enema, with the proviso that the solution must be permanent for storage prior to use. Hence the enema, the composition of which is given above. Numerous emetine compounds were tried. Emetine-bismuth-iodide was discarded as insoluble in ether oil. Emetine oleate appeared especially suitable ; it is a stable compound readily miscible with the initial solvent, whether olive oil or liquid paraffin, and contains about 50 per cent. emetine, though it by no means follows that the efficacy of these preparations in destroying entamoebae or cysts depends entirely on the quantity of the drug.

For oral use several preparations are mentioned.

Emetine-bismuth-iodide is objectionable to patients, owing to a complex interaction in the stomach with the formation of emetine hydrochloride, bismuth oxychloride and the liberation of hydriodic acid.

It was to obviate these disadvantages that a periodide was made. *Emetine periodide* ($C_{29} H_{40} N_2 O_4 . 6I$) contains 38·7 per cent. emetine and 61·3 per cent. iodine. Insoluble in water, it is readily soluble in alcohol, chloroform, ether and other solvents. On the analogy with other alkaloidal periodides the alkaloid would split off from the iodine atoms and leave the emetine molecule free for therapeutic activity. E.P.I. in the presence of acid liberates, practically speaking, *no* emetine. With regard to alkali, a third of the emetine is liberated in a couple of hours at body temperature under the influence of 5 per cent. caustic soda, a large proportion by 1 per cent. caustic soda, and a considerable proportion (one-ninth) by 2 per cent. sod. carb. in 10 minutes at body temperature. The conclusion is that the emetine contained in E.P.I. is not liberated in the stomach, whereas it must be when E.B.I. is administered.

P. H. M-B.

PANAYOTATOU (A. G.). **Emétine et amibiase en Egypte.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 263–269.

Statistics are given showing that, in Egypt at any rate, in a population utterly devoid of hygienic principles, the systematic employment of emetine has diminished in a surprising manner the number of cases, not only of dysentery, but also of liver abscess. The figures are taken from two sources, the Hygienic Bureau in Alexandria and the Greek Hospital. In 1899 there were in Alexandria 68 deaths from abscess of the liver and 212 from dysentery ; in 1922 these figures were 4 and 82. In the Greek Hospital there were, in 1914, 40 cases of dysentery and 24 of liver abscess ; in 1922, 27 cases of dysentery are recorded and none of liver abscess. According to the laboratory statistics of the same hospital, *E. histolytica* is the principal cause of dysentery in Alexandria, being found in 59 per cent. ; the percentage ascribed to trichomonas appears to be small, about a tenth of that number.

P. H. M-B.

LE ROY DES BARRES (A.). **Colite et pericolite ascendante de l'angle droit du colon. Traitement par l'émétine. Guérison.**—*Rev. pratique des Maladies des Pays Chauds.* 1923. Feb. pp. 71–73.

Pericolitis, due to amoebic infiltration of the bowel, thickening of its coats and peritoneal adhesions, often accompanied by subacute suppuration, may resemble in its results a malignant tumour. Sometimes the growth may take on a rapid course and perforate.

A case of this nature is described in a lady who had been 25 years resident in Cochin and had frequently suffered from amoebic dysentery. The illness commenced with severe abdominal pains and her general appearance suggested peritonitis. On palpation a painful, slightly moveable, tumour was discovered in the right upper abdomen. The sudden onset rather suggested an intussusception; in the faeces, however, numerous *E. histolytica* were found. The patient rapidly recovered on small doses of castor oil and emetine injections.

P. H. M-B.

MARCHOUX (E.). **Le stovarsol guérit rapidement la dysenterie amibienne.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 79–81.

The good effects in syphilis of Stovarsol (oxyaminophenylarsinic acid) given by the mouth have stimulated the author to try it in amoebic dysentery. In the first cases thus treated the cysts of *E. histolytica,* which had persisted after a course of emetine, rapidly disappeared, and also three patients having *coli* cysts were completely cured of this infection by the administration of 0·25 gm. twice daily in pill form. Success was equally remarkable in chronic cases of amoebic dysentery with passage of cysts; 20 pills given as a course (two daily) rapidly cured a case of four years standing, but at the end of three weeks, some ten days after the cessation of treatment, the entamoebae and cysts had reappeared and the " cure " had to be recommenced. Small doses are perhaps more efficacious; in some cases the author gives the drug in 0·25 gm. doses every second day for two months.

P. H. M-B.

HUPPENBAUER (K.). **Yatren und Amöbenruhr. Zu den gleichnamigen Veröffentlichungen von Dr.** E. BIRT- **Schanghai und Dr.** W. MENK- **Hamburg in Nr. 7 bzw. 10 d. Wschr. 1923.**—*Muench. Med. Woch.* 1923. May 11. Vol. 70. No. 19. p. 602.

Reports two more cases of chronic intractable dysentery successfully treated with Yatren. It was given in 5 per cent. solution in 200 cc. of water after previous clearance of the bowel by enemata. The Yatren lavage was retained for one hour. For after-treatment Yatren pills, each containing 0·25 gm., are recommended, taken 2–4 at a time on two consecutive days once a week [see this *Bulletin,* Vol. 20, p. 405].

P. H. M-B.

SNIJDERS (E. P.). **Plasmolysis in Amoebic Cysts.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 162–172. With 1 chart. [3 refs.]

It has long been known in botany that living protoplasm does not stain red in 2 per cent. solution of eosin, while KUENEN and SWELLENGREBEL have used this method for the detection of living cells in human stools, especially amoebae and amoebic cysts. Dead protoplasm does not always take up eosin readily, *e.g.,* if the cell wall is impermeable; therefore, staining with eosin is to be regarded always as a sign of death, but failure to stain is not always a sign of life.

From observations of this nature, and his failure to demonstrate the organism in the faeces of sucklings, the author is of opinion that Blastocystis is allied to the yeasts.

The cysts of *E. histolytica* show a decided form of plasmolysis. Using saline solution with a lower concentration than 2·5 per cent. NaCl. plasmolysis seldom occurred, but with 3 per cent. NaCl. nearly all the cysts, if not too old, plasmolysed. Before this occurs the cysts decrease in size, owing to the diffusion of water from the cell into the surrounding hypertonic saline. The form of this plasmolysis varies with different kinds of cysts ; in the case of *E. histolytica* and *E. coli*, the protoplasm parts from the cyst wall at a certain point and becomes crescentic in shape, while the cyst wall preserves its spherical form. The concentration requisite for initial plasmolysis is 2–4 per cent. NaCl. In the limax type the whole cyst shrinks, and the thick and apparently flexible cyst wall crinkles ; the concentration requisite for plasmolysis varies widely for different species of this type. The same cyst may be plasmolysed and deplasmolysed as many times as the observer likes, but when the cyst loses this power the protoplasm becomes more opaque and granular, and stains red with eosin ; both these symptoms, *i.e.*, loss of plasmolysibility and susceptibility to eosin, are signs of death. These are more useful signs than the results of infection with *E. histolytica* cysts in kittens.

P. H. M-B.

i. KOFOID (Charles Atwood) & SWEZY (Olive). **Mitosis in** ***Endamoeba dysenteriae*** **in the Bone Marrow in Arthritis Deformans.**—*Univ. California Public. Zool.* 1922. Apr. 21. Vol. 20. No. 11. pp. 301–307. With 7 text figs. [14 refs.]

ii. KOFOID (Charles A.), BOYERS (Luther M.) & SWEZY (Olive). ***Endamoeba dysenteriae*** **in the Lymph Glands of Man in Hodgkin's Disease.**—*Ibid.* No. 12. pp. 309–312. With 4 text figs. [2 refs.]

i. In this preliminary note it is stated that the cells interpreted as amoebae [see this *Bulletin*, Vol. 19, p. 684] are really parasitic amoebae and are not amoeboid human cells.

The interpretation is based on the argument that mitosis in the Rhizopoda and Metazoa is of two distinct types, which cannot be confused by a trained protozoologist. In the mitosis of the human (metazoan) cell the nuclear membrane disappears, there is no " intradesmose " or deeply-staining strand in the spindle, and the number of chromosomes is much greater.

From the presence of the amoebae in the lesions of ELY's second or nonbacterial type of arthritis deformans the term amoebiasis of the bones would more accurately describe the disease.

The exact species may be *Councilmania lafleuri* [but see this *Bulletin*, Vol. 19, p. 20].

ii. Since publication of the last paper on this subject [*loc. cit.*, p. 685] a fourth case of Hodgkin's disease has been examined.

In the parts of the gland most affected the authors have found amoeboid cells with vesicular nuclei, which they interpret as parasitic amoebae by the line of argument used in the above paper.

P. H. M-B.

i. Coles (Alfred C.). **Acute Amoebic Dysentery in a Man who had never been out of England.**—*Brit. Med. Jl.* 1923. May 12. p. 809.
ii. Patterson (S. W.). **Amoebic Dysentery in Women.**—*Med. Jl. Australia.* 1923. Mar. 24. 10th Year. Vol. I. No. 12. p. 323. [4 refs.]
iii. Fischer (Walter). **Neue Ergebnisse der Amöbenforschung.**—*Klin. Woch.* 1923. Apr. 16. Vol. 2. No. 16. pp. 725–727.
iv. Hirai (Ikutaro). **[On Calomel Treatment of Infantile Amoebic Dysentery.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1923. Jan. No. 2311. [Summarized in *Japan Med. World.* Tokyo. 1923. May 15. Vol. 3. No. 5. p. 108.]
v. Ryle (J. A.). **Treatment of Liver Abscess by Aspiration.** [Correspondence.]—*Lancet.* 1923. May 19. p. 1026.
vi. Le Noir & de Fossey (Mathieu). **L'épreuve biliaire dans la dysenterie amibienne.**—*Arch. des maladies de l'appareil digestif et de la nutrition.* 1922. Vol. 13. No. 2. pp. 114–121.

i. A transport driver of the R.A.F. stationed at Uxbridge, Margate and Lee-on-Solent, contracted diarrhoea in February, 1922. Dysenteric symptoms supervened in August, 1922; the stools were typical of amoebic dysentery and the entamoebae were found by the author in November. The patient completely recovered on emetine-bismuth-iodide.

ii. During one week *Entamoeba histolytica* has been found in the faeces of two women who have always resided in Victoria. The first had suffered intermittently from slight attacks of diarrhoea for 20 years; in the second case the illness commenced acutely.

iii. An uncritical review of the morphology of the intestinal amoebae; no original observation.

iv. Calomel was used in infantile cases with success. The dose was either large, 0·02 gm., or small, 0·002 gm.; the former was given two or three times, the latter several times in succession.

v. An ingenious approximation to aspiration of liver abscess was recommended by Aretaeus, the Cappadocian, in the second century A.D. Recognizing the characteristics of liver pus he advocated its evacuation by means of the cautery; he was also familiar, it seems, with the diagnostic importance of pain in the right shoulder joint.

vi. See this *Bulletin*, Vol. 19, p. 688.

P. H. M-B.

BACILLARY DYSENTERY.

Davison (Wilburt C.). **A Bacteriological and Clinical Consideration of Bacillary Dysentery in Adults and Children.**—*Medicine.* Baltimore. 1922. Nov. Vol. 1. No. 3. pp. 389–510.

This monograph embodies a very complete and detailed account of bacillary dysentery; but original observations are meagre. Reviewing the occurrence of dysentery in war time, the author is of opinion that for its prevention in campaigns we are nearly as badly off as was Xenophon on his retreat from Persia.

Shiga's bacillus has a worldwide distribution. Of 35 cases of bacillary dysentery in children, the author found that 31 were due to Flexner and 4 to Shiga bacilli. In one child he isolated the Flexner bacillus from the urine. A negative culture is of no value in suspected dysentery. As to viability, the author has alternately frozen and thawed a saline suspension of Flexner bacilli daily for 33 days and found that they remained alive. He relies much on agglutination in diagnosis, using the Dreyer technique, but finds that living cultures vary from time to time in their agglutinability.

In discussing bacteriolysants as therapeutic agents, the treatment of twelve children by this method could not convince him that any benefit accrued. The Herelle phenomenon probably depends upon a bacteriolytic enzyme produced by bacteria, which not only dissolves bacteria but also favours the multiplication of bacteria that produce it.

In countries where amoebic dysentery is not endemic, a presumptive diagnosis of bacillary dysentery may be made in children who have had a sudden febrile attack and are passing bloody stools. The diagnosis in children is much simpler than in adults, for the intestinal reaction in the former is much more severe and consequently the stools consist almost entirely of blood and mucus. Treatment follows the well-recognized lines, but the author favours in the case of small children the intraperitoneal injection of salines or 5 per cent. dextrose.

[This is a very thorough review which must be read in the original; it has been compiled from papers already reviewed in this *Bulletin*; there are no less than 455 references on which a running commentary is made in the text, besides references to ancient history.]

P. H. M-B.

LORENTZEN (Werner). **Beitrag zur Pathogenese der Bacillenruhr.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Dec. 30. Vol. 240. No. 1–2. pp. 184–202. [73 refs.]

This report, based upon a study of war material (16 cases), is replete with pathological details, many of interest to the profound student of pathology.

The character of the pathological anatomy of bacillary dysentery would seem to depend upon whether the changes are produced solely by the specific dysentery bacillus or are in any way influenced by a secondary invasion, or possibly a mixed infection by organisms of the *Bacillus coli* group. The primary seat of the bacillus and the path of invasion are both moot points. It is generally admitted that the process begins in the large intestine and most often in the lower segments. On account of this fact BENEKE suggested that the anus was the usual path of entry. It is quite certain that the bacilli gain entrance through the intestinal mucosa and not *via* the blood or lymph streams. The exact action of the organisms upon the tissues is again difficult to understand for there appears to be no unanimity whether the specific effect is produced either by an *endotoxin* or an *exotoxin*.

The bacteriology of these cases was undertaken by GROSS, who has found dysentery bacilli so regularly in the bowel at recent autopsies that there is little probability that other organisms can give rise to similar pathological changes; furthermore, that they may disappear very speedily from the bowel from the eleventh to sixteenth day of the disease. Very exceptionally are they to be found in the apparently healthy jejunum. Shiga-Kruse bacilli appear to be confined solely to the bowel wall, but the non-toxic varieties can be found in the liver, spleen and mesenteric glands. As a general rule, fatal cases are due to the Shiga-Kruse bacillus, but occasionally the so-called non-toxic strain may be able to produce lesions every bit as severe. The bowel attacked by *B. dysenteriae* is very prone to mixed infections of all kinds; it may be *B. coli*, Streptococci or *B. paratyphosus* B.

The following questions remained to be answered :—

1. What are the characteristic lesions of a primary bacillary dysentery ?
2. How do they progress ?
3. The situation of the bacilli.
4. At what stage does a secondary infection ensue ?
5. Are changes characteristic of bacillary dysentery produced in the lymphatic glands and in the liver ?
6. Can the Shiga-Kruse dysentery be differentiated from pseudo-dysentery (Y and Flexner) ?

In four cases of the series Shiga-Kruse bacilli were isolated from the bowel wall ; in one they were found in the stomach and small intestine, but not in the colon ; in five others the blood agglutinated this bacillus ; in three cases Y bacilli were obtained and in one Flexner. In one case there was a well marked secondary infection and another died of dysentery while suffering from a primary influenza. The earliest changes were seen in patients who during life had suffered for one or two days from symptoms of dysentery. In these it appears that bacillary dysentery commences as an inflammation of the superficial layers of the mucosa, passing on to hyperaemia and diapedesis into the interstitial tissues, together with oedema of the mucosa and submucosa till a fibrinous exudate is produced. In the intestinal cells the dysentery organisms are visible, lying in small clumps or singly, it may be, engulfed by wandering leucocytes. Occasionally the Lieberkühn's crypts are filled with exuded phagocytes, but for the most part their lumen is constricted by surrounding pressure. The lymphoid follicles appear to be specially affected, containing necrotic foci and accumulations of polymorphs. There is no evidence that collections of lymphoid tissue constitute the starting point of the dysenteric process, for no organisms were seen in these situations. On the other hand, it is probable that peculiarly attenuated epithelium covering these follicles is the first to be attacked. In the later stages there is still further destruction of the mucosa, the glands are destroyed and the fibrinous exudate increases. The muscularis mucosae remains and is usually spared, though infiltrated. The ganglion cells show toxic changes. At the end of the third week actual ulceration commences ; sometimes extending as far as the muscularis, at others deeper to the uppermost fibres of the muscular coat. The margin of these ulcers is formed of mucous membrane showing inflammatory changes and even small haemorrhages. At the end of the fourth week the ulcers may have extended as far as the serosa ; on the contrary, the lumen of the mucosa glands is distended and the columnar cells themselves exhibit mitotic activity. In the unaffected regions of the submucosa the tissue is packed with fibroblasts, connective tissue and plasma cells.

Changes in the ileum.—The extension of the inflammatory process to the ileum is frequently found. Even when appearing to be normal macroscopically hyperaemia and other changes are visible on microscopic examination. However, in spite of their appearances, no bacilli were visible, nor were they recoverable on culture.

Several points of interest emerge from this study. The author finds evidence of regeneration of the columnar epithelium, for even beneath the scar-tissue cells with mitotic nuclei are always visible, clearly showing that the mucosa itself is regenerated from the fundus of the follicles. Even in the necrotic area collagenous and elastic fibres appear to escape as do also the smaller arteries. A point not previously referred to is the effect upon the ganglion cells of the Meissner and Auerbach plexuses; these are damaged, but are seldom destroyed unless involved in a zone of necrosis, and it is possible that this aspect of the subject affords some explanation of disordered mechanism of the bowel which persists for some time after the lesions of bacillary dysentery have healed.

The mesenteric lymph glands show marked tissue reaction and phagocytosis of cell detritus, occasionally also of red blood corpuscles and leucocytes. In one instance the Flexner bacillus was isolated in pure culture. The absence of any decided pathological changes in the liver is remarkable, when one considers the tissue disturbance which had taken place throughout the portal area.

P. H. M-B.

ZLATOGOROFF (S. J.), GORODKOWA (A. A.) & KARETNIKOWA (W. W.). **Zur Aetiologie der Ruhr, mit besonderer Berücksichtigung der Ruhrepidemie von 1920 in Petersburg.** [Etiology of Dysentery, with Special Reference to the Epidemic of 1920 in Petrograd.]—*Cent. f. Bakt.* I. Abt. Orig. 1923. June 28. Vol. 90. No. 5. pp. 316–322. [18 refs.]

The Petrograd epidemic commenced in June, 1920, and within six months 4,431 cases were recorded with 846 (19 per cent.) deaths. The morbidity curve reached its maximum in summer and autumn. The organisms responsible were of four varieties; the most common were bacilli of Shiga and Flexner, though the Hiss-Russel and Strong's bacillus were also represented. A large proportion of clinical cases could not be confirmed bacteriologically; in these, organisms closely allied to the dysentery group were isolated, such as B. Kulescha-Titoff, B. para-Shiga and B. para-Flexner.

Bacteriological investigations were confined to blood-and-mucus stools and post-mortem material. Altogether 708 cases, including 355 stools and 24 intestines post-mortem, were examined. In 297 cases no scientific diagnosis could be made; in 119 strains of different dysentery bacilli were present: 58 were Shiga, 23 Hiss-Russel, and 42 Flexner.

The protozoological investigations (protozoa (?) species were demonstrated on 65 occasions) were undertaken by YAKIMOFF.

P. H. M-B.

KREUSER. **Erfahrungen aus der Ruhrepidemie von 1914–1920 in den Kreisen Saarbrücken und Saarlouis.** [The Dysentery Epidemic of 1914–20 in the Saarbrucken and Saarlouis Districts.]—*Ztschr. f. Hyg. u. Infektionskr.* 1923. Vol. 99. No. 2. pp. 166–185. With 3 text figs. [34 refs.]

A historical review of dysentery in Germany in recent times shows that few if any cases were noted in the war of 1864 against Denmark or that of 1866 against Austria; but in the Franco-Prussian war of 1870–71 a large epidemic is recorded with 36,652 cases and 2,380 deaths, the majority of cases occurring in and around Metz in midsummer and early autumn. Since that date the disease has never quite disappeared from Alsace-Lorraine. It is difficult to estimate how far the disappearance of the disease from the rest of Germany is attributable to improved hygiene and how far to progress in bacteriology. In ordinary times epidemics of dysentery exhibit a distinct seasonal prevalence, except in confined populations, such as institutions and lunatic asylums. Observations from 1914–20 in the Saarbrucken area show that the epidemic begins at the end of June and reaches its maximum in August or September. The banishment of dysentery is mainly a hygienic problem, but in spite of advances in hygiene the disease has never left Metz or Poland. The author believes that in this very infectious disease the main vector is the house-fly, that it is spread in an epidemic manner by movements of people, and is fostered from year to year by healthy carriers and convalescents, and kept up specially by babies and small children who readily contract the infection.

P. H. M-B.

BEARE (F. H.). **Bacillary Dysentery in Children.**—*Med. Jl. Australia.* 1923. Mar. 31. 10th Year. Vol. 1. No. 13. pp. 340–350. [24 refs.]

The Year Book of the Commonwealth of Australia contains no entry of bacillary dysentery as a cause of death and yet many individuals die annually from this cause. The disease is not yet recognized as common in Australia.

In Adelaide Children's Hospital, of 207 cases of diarrhoea the stools in 38 per cent. contained blood and mucus. The majority of babies contracting bacillary dysentery were fed on cow's milk; only five, or 7 per cent., were totally breast-fed. The influence of faulty feeding on the incidence of the disease was clearly proved. Flexner's bacillus was the organism most frequently isolated; Shiga's bacillus was not obtained. The probability of isolating the organism from the stools decreases as the case progresses; up to four days it was obtained in 82 per cent., but a period of 28 days proved to be the limit.

Case to case infection does not appear to be uncommon, for 63 per cent. of patients in this series had previously been associated with another case of diarrhoea. Though dependence was not absolutely proved, the association of the cases with horses heavily infested with flies was close, and in 41 out of 51 the infection originated in proximity to a yard or stables in which horses were kept.

One of the most constant prodromal signs was drowsiness, and the disease itself is ushered in with severe diarrhoea, which may be accompanied by vomiting. The clinical picture is, as a rule, one of severe toxaemia. The course of the disease is generally short. The child, instead of being drowsy, becomes lively and more like normal. Death may take place at any time and out of this series 26 died—a mortality of 33 per cent.; not uncommonly it is due to terminal bronchopneumonia. Dysenteric arthritis of the knee occurred in one case only. There was one death from pyelo-nephritis. In quite half the cases, at autopsy, otitis media was present.

As regards treatment the dosage of antidysenteric serum (prepared from all races of Flexner's bacillus V–Z) has been as follows:—In children under 2 years 10 cc., in those over 2 years 30 cc., subcutaneously daily for 4 days. The mortality amongst 31 patients treated with serum was 5, *i.e.*, 16 per cent., while amongst 58 patients not treated with serum it was 21, *i.e.*, 36 per cent. A table is given of details and results of treatment.

P. H. M-B.

KUHLE (Willi). **Erfolge prophylaktischer und therapeutischer Impfungen mit Ruhrserum.** [Preventive and Therapeutic Administration of Anti-Dysentery Serum.]—*Deut. Med. Woch.* 1923. May 18. Vol. 49. No. 20. pp. 645–646. [6 refs.]

A small epidemic of bacillary dysentery in infants is here recorded. The first case occurred suddenly in a breast-fed infant; the second, which proved fatal, ten weeks later. Subsequently 13 other cases occurred in the clinic. The bacillus responsible appeared to be Flexner-Y. The 23 remaining infants which had up to that time escaped infection were injected subcutaneously with 10 cc. polyvalent antidysenteric serum. The 13 dysenterics were treated in the same manner with the same dosage and speedily recovered. The most suitable dietary was found to be whey. A serum-rash supervened in three instances. The author considers that the antidysenteric serum exerts a distinct prophylactic effect.

P. H. M-B.

i. DE FARIA (Gomes) & PACHECO (Genesio). **A proposito da dysenteria bacillar no Rio de Janeiro.** [Bacillary Dysentery in Rio de Janeiro.]—*Brazil Medico.* 1923. Apr. 7. Year 37. Vol. 1. No. 14. pp. 187–189.
ii. LINS (Abdon). **Considerações sobre a dysenteria bacillar do Rio de Janeiro.**—*Ibid.* Apr. 21. No. 16. pp. 215–217.
iii. DE FARIA (Gomes) & PACHECO (Genesio). **Ainda duas palavras sobre a dysenteria bacillar no Rio de Janeiro.** [Further Remarks on Bacillary Dysentery in Rio.]—*Ibid.* June 9. No. 23. pp. 313–314.

i. The research detailed in this paper was instigated by the announcement of LINS that Morgan's bacillus and an organism which he named *Escherichia braziliensis* were the causes of dysentery in Rio de Janeiro. The authors found that in 20 per cent. of cases of diarrhoea in children and in 32 per cent. of adult patients examined one or other types of *B. dysenteriae* were present, and that from 50 per cent. of diarrhoeic stools of children Morgan's bacillus was isolated, but this was met with also in normal stools of children. The authors declaim against the practice of baptizing every coli-like organism with a new name.

ii. Dr. Lins states that in naming his bacillus he had been guided by the table of coli-like organisms given by CASTELLANI and CHALMERS.

iii. After further investigations, the authors maintain that in a large majority of cases of dysentery one or other of the recognized bacilli can be isolated—Shiga-Kruse, Flexner, Hiss and Russell, etc.—and that the organism isolated by LINS is merely a variety of *B. coli*, of no etiological significance [see this *Bulletin*, Vol. 20, p. 408].

H. Harold Scott.

LICHTENSTEIN (A.). **Chronic Bacillary Dysentery.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 268–279. [8 refs.]

The author believes that chronic bacillary dysentery is not necessarily a serious disease; at the military stations of Weltevreden and Meester Cornelis it usually does not undermine the patient's constitution. The disease is generally due to the atoxic strains of the bacilli, though the Shiga-Kruse organism may also produce it. The agglutination test can be used for diagnosis only if the titre is above 1 : 200. In treatment the injection of auto-vaccines has little or no effect, but as a protection in time of war soldiers should be inoculated with Boencke's dysbacta.

P. H. M-B.

SHAW (B. H.). **Infection in Mental Hospitals, with Special Reference to Floor Treatment.** [Dysentery. Tuberculosis.]—*Jl. Mental Sci.* 1923. Jan. Vol. 69. No. 284. pp. 24–45. [12 refs.]

In March, 1922, a number of tubes, each containing about 5 gm. of sterile earth, were inoculated with B. Flexner; some of the tubes contained dry earth, the remainder moist; some were placed in daylight, others in a dark cupboard.

The organisms in the dry tubes were all dead at the end of the fourth week, whether exposed to sunlight or not. Desiccation, sunlight and heat are the most effective means of destroying the Flexner bacillus. Basing his work on these experiments and published reports upon the carrier rate in bacillary dysentery, the author has reached the following conclusions:—

Recent cases of dysentery should only be considered recovered when negative laboratory returns for one month coincide with clinical recovery in that period.

Should dysentery break out in a ward, the stools of all contacts should be examined bacteriologically twice weekly for a period of four weeks after the isolation of those affected, while the faeces of all patients who have ever had dysentery should be examined bacteriologically once a week for a period of three months.

The detection of a Flexner carrier is more difficult than that of a Shiga, for the former is generally in good health and suffers little inconvenience. The organism may also appear in the faeces intermittently.

The possibility of soil-pollution should be considered, as well as the rôle of flies as possible carriers. No patient who has ever had dysentery should be permitted to work in the kitchen or be employed in handling food. All polished floors should be scrubbed at frequent intervals. Should dysentery occur the polished floor should be scrubbed at least three times a week for a month. In order to reduce infection to a minimum the installation of a central vacuum cleaning system is desirable.

P. H. M-B.

BOLTON (J. Shaw) & MCGRATH (M. J.). **Asylum Dysentery and Allied Infections (Further Report).**—*Eighth Ann. Rep. of the Board of Control for the Year 1921. Lunacy and Mental Deficiency.* pp. 87–92. 1922. H.M. Stationery Office.

During 1921 six cases of dysentery occurred in the West Riding Mental Hospital from which Flexner's bacillus was isolated, three cases of typhoid fever and one of paratyphoid. Fifty-seven faecal specimens were examined and Flexner's bacillus isolated from nine. The authors consider it impossible, without employing bacteriological methods, to diagnose between dysentery, typhoid, paratyphoid and ordinary diarrhoea. Whenever active dysentery occurs numerous positive agglutination results can be obtained amongst possible contacts. During the period under review 589 patients and members of the staff have been vaccinated against dysentery, the routine dose being 1,000 millions followed in ten days by a further 2,000 millions. In no instance have troublesome complications ensued and, as a rule, little discomfort. With two exceptions, both of whom had previously suffered from dysentery, not a single inoculated case developed the disease.

P. H. M-B.

OLITZKI (Leo). **Bericht ueber den Verlauf einer Y-Ruhr-Epidemie in der städtischen Heilanstalt für Nerven- und Gemütskranke zu Breslau.** [Epidemic of Y Dysentery in the Municipal Mental Hospital at Breslau.]—*Cent. f. Bakt.* I. Abt. Orig. 1923. May 4. Vol. 90. No. 4. pp. 262–264.

The Asylum at Breslau is composed of six blocks, three for each sex, and the patients are not permitted to intermingle in any way. Cases of bacillary dysentery in 1922 were confined solely to the female side. They continued to crop up in various blocks, so that the possibility of a carrier being concerned was mooted. From one nurse the Y bacillus was recovered from the faeces, and in 20 others the serum agglutinated this organism.

P. H. M-B.

VON WERDT (F.). **Die pathologische Anatomie der chronischen Ruhr. I. Teil. Die makroskopisch erkennbaren Veränderungen.** [Morbid Anatomy of Chronic Dysentery. Naked Eye Changes.]—*Frankfurter Ztschr. f. Path.* 1922. Vol. 28. Pt. 3. pp. 378–406.

The material was derived from autopsies on soldiers who died from bacillary dysentery during the war. The author describes both the macroscopic and microscopic pathology of the bowel in the acute and chronic stages of the disease, and the descriptions do not differ in any way from those generally accepted. In the chronic stage he observed perforation of the appendix twice, with consequent peritonitis. There is an extensive bibliography.

P. H. M-B.

CUTTER (Robert K.). **Bacillary Dysentery. Report of Case, with a Study of the Intestinal Bacteriophage.**—*Jl. Amer. Med. Assoc.* 1923. June 9. Vol. 80. No. 23. pp. 1674–1675.

The case of accidental infection with bacillary dysentery here reported is interesting since the infecting organism is known, the time of infection and the incubation period, while the carrier state supervened.

The author infected himself in October, 1922, when filtering a culture of *B. dysenteriae* (Flexner); there were no symptoms for 28 hours after the accident, when after preliminary chilly sensations clinical dysentery set in. Blood and mucus stools persisted for seven days and from each the Flexner bacillus was cultured. It was again isolated after the faeces had been normal for a week. The serum agglutinated a stool culture of *B. dysenteriae* in a dilution of 1 : 80 on the eighth day; this persisted for 1½ months. Filtrate from the faeces showed the Flexner bacteriophage from the fourth to ninth day, but it was not present 21 days after the onset. This bacteriophage was active against *B. dysenteriae* (Shiga) and *B. coli* as well.

P. H. M-B.

VAN NITSEN (R.) & MORTIAUX (Ch.). **La rhubarbe dans les dysenteries bacillaires.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 1–4.

Two Europeans and 14 natives suffering from bacillary dysentery were treated with rhubarb according to BURKITT's method [see this *Bulletin,* Vol. 19, p. 41]. The results were very satisfactory and superior to those obtained by use of antidysenteric serum. On account of its simplicity, cheapness and convenience, the authors consider rhubarb to be a most valuable remedy in the treatment of this disease.

P. H. M-B.

GUIMARÃES (Aristides). **Bacteriologia e vaccinotherapia da dysenteria.** [Vaccine Treatment of Dysentery.]—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. Feb. Vol. 4. 2nd Ser. No. 12. pp. 342–343.

In an outbreak of dysentery, in which the Shiga bacillus was found, prevalent between October, 1921, and February, 1922, a mixed vaccine of dysentery, coli, and staphylococcus organisms was employed with excellent results. For some of the cases, during the first three months, anti-sera were also used. The doses of the vaccines comprised 100 to 600 millions of the Shiga organism, 100 to 800 of the coli, and 100 to 200 of the staphylococcus. Further details are not recorded.

H. Harold Scott.

COMBIESCO (D.), MAGHERU (Alice) & CALALB (G.). **Vaccination préventive contre la dysentérie, par la voie digestive, chez le lapin.** —*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 904–906. [2 refs.]

It is possible to protect rabbits against dysentery by administration of cultures by the mouth, but the results obtained are inconstant. With the same dose some rabbits become protected, whilst others die. Immunization may occur after small doses ; in other instances none is produced with large ones.

The serum of the animal immunized *per os* contains neither agglutinins nor precipitins, while possessing considerable antitoxic power and thus proving that dysenteric toxins can traverse the mucous membranes. Many of the animals develop a toxic paralysis. On the whole, it may be said that inoculation *per os* produces a general as well as a local immunity.

P. H. M-B.

BALTEANO (I.). **La vaccination antidysentérique par la voie cutanée chez les lapins.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 943–944.

It has already been shown by PETRUSCHKY* that it is possible to immunize man against dysentery by rubbing emulsions of dysentery bacilli into the skin. For the present experiments rabbits were employed. The skin was shaved and a dense emulsion of Shiga's bacillus rubbed in vigorously. This operation was followed shortly by desquamation of the epidermis ; a scab formed which was shed 7–8 days afterwards. Two rabbits succumbed and an inflammatory condition of the bowel was found at autopsy. It was proved that the specific agglutinins appeared in the serum, while the animals developed a very considerable immunity and could tolerate the intravenous injection of 2 cc. ot an emulsion of Shiga's bacillus, of which 0·5 cc. was fatal to the untreated control animal. The author believes that this is an easy and rapid method of producing immunity.

---

* PETRUSCHKY (J.). Erfahrungen über percutane Schutzbehandlung bei Ruhr.—*Med. Klinik.* 1919. Vol. 15. p. 864.

P. H. M-B.

WIDOWITZ (Paul). **Ueber Dysenterieagglutinationen bei Kindern.**—*Wien. Klin. Woch.* 1923. Mar. 22. Vol. 36. No. 12. pp. 220–221.

The author investigated the serum of 175 children to test the so-called normal agglutination, that is the power of which the serum of apparently normal individuals is possessed to agglutinate dysentery bacilli, especially the Flexner-Y strain. He concludes that the formation of agglutinins specific for Flexner-Y denotes an infection with these organisms and agglutination implies the persistence of residual agglutinins. Should co-agglutination with other closely allied organisms take place, it denotes that an infection with these organisms has also taken place, it may be in the early years of life.

P. H. M-B.

MCCARTNEY (James E.) & OLITSKY (Peter K.). **Separation of the Toxins of** *Bacillus dysenteriae* **Shiga.**—*Jl. Experim. Med.* 1923. June 1. Vol. 37. No. 6. pp. 767–779. [13 refs.]

According to Olitsky and KLIGLER, the poison of *B. dysenteriae* Shiga can be separated into a true soluble exotoxin and an endotoxin, the product of autolysis or disintegration [see this *Bulletin*, Vol. 16, p. 18]. The exotoxin has a specific action on the central nervous system of the rabbit ; the endotoxin affects only the intestinal tract. The cultures used in these experiments were the same strain of bacillus as was employed by the observers already quoted. The experiments showed that Shiga bacilli, when grown in a well aerated medium, form in one to three days a soluble toxin which can be recovered from bacteria-free filtrates. This exotoxin acts upon the central nervous system of the rabbit, producing haemorrhages and necrosis in the medulla and upper part of the cervical cord, but it is entirely without effect upon the intestinal tract. On the other hand, autolysates of the bacteria produce similar nervous lesions, and also affect the intestinal mucosa.

The exotoxin can be produced in a pure state, but endotoxin or enterotoxin, which is the result of bacterial disintegration, is always mixed with exotoxin. By anaerobic methods the neurotoxin-producing activity can be suppressed, by growing the organisms in fluid medium either under a petrolatum seal or in an anaerobic jar. Shiga bacilli, when grown in fluid medium contained in a sac implanted intra-abdominally, survive and multiply for at least one month. Rabbits show the results of dialysis within five days after implantation ; the animals die of absorption of exotoxin with lesions in medulla and cord. Rabbits harbouring sacs of a lesser degree of permeability produce a higher titre of agglutinins in their blood. The contents of the sacs after one month *in abdomine* are highly toxic for normal rabbits and immunity is produced to subsequent injections of both exotoxin and endotoxin.

The work of Olitsky and KLIGLER with regard to the biological and physical differences of these two toxins is hereby confirmed. The practical outcome of this work concerns the preparation of an effective antidysenteric serum which should contain both endotoxic and exotoxic antibodies. The intravenous injection into horses of live Shiga bacilli has yielded a serum containing 2,000 anti-exotoxic units per cc., as well as endotoxic and bacterial antibodies. The anti-infectious potency is such that 0·008 cc. protects rabbits against two lethal doses of Shiga bacilli.

P. H. M-B.

YOSHIOKA (Masaaki). **Ueber das Bakteriengift, insbesondere die löslichen Gifte des Dysenterie-, Typhus- und Paratyphusbazillus. (III. Mitteilung.)** [Bacterial Toxin, especially the Soluble Toxins of the Dysentery and Enterica Bacilli.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* I. Teil. Orig. 1923. May 15. Vol. 36. No. 5–6. pp. 395–418. [2 refs.]

The soluble toxins of typhoid, paratyphoid, and dysentery bacilli have been the objects of frequent study. The most potent toxin of typhosus broth (in 0·5 cc. doses) kills a rabbit of 800 gm. in 24 hours. In order to produce this powerful toxin it is necessary to select the best strain and subculture it on the optimum medium, which consists of Fukuhara's solution with 1 per cent. Witte's peptone bouillon. Rabbits above 1,600 gm. are more susceptible to typhoid toxin than rabbits below that weight, and guinea-pigs are much less susceptible than rabbits. The acutely (intravenous) poisoned rabbit dies in a few minutes; in chronic poisoning the animal becomes emaciated. It is easy to demonstrate the presence of toxins in the broth filtrate of a dysentery culture.

P. H. M-B.

i. COURMONT (Paul) & ROCHAIX (A.). **Variations *in vitro* de la fermentation des " sucres " par les bacilles du groupe dysentérique.**—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 784–786.

ii. —— & ——. **Variations de la fermentation des " sucres " par les bacilles dysentériques sous l'influence du " co-entraînement."**—*Ibid.* pp. 786–788.

i. The authors explain their method of " educating " the classical strains of dysentery bacilli to ferment sugars which they do not normally ferment. The medium employed consisted of 2 per cent. peptone water containing 1 per cent. of the sugar and litmus as an indicator.

Shiga's bacillus was cultivated continuously for four months on the following substances, which it does not normally ferment :—saccharose, lactose, maltose, galactose, sorbite, xylose, glycogen, dulcite, inulin, dextrine, amidon and inosite. At the end of ten days the bacillus acquired the power of fermenting galactose, a property which became permanent. Glycogen fermentation was acquired at the end of two months ; inosite at three and a half months ; but no fermentation of the other substances was observed. Flexner's bacillus treated in the same manner fermented glycogen at the end of two, and sorbite at the end of three months. Hiss' bacillus acquired the power of fermenting saccharose in three months and sorbite in four. After some time maltose was fermented, a property which persisted subsequently. Strong's bacillus acquired the power of fermenting mannite and glycogen.

ii. A bacillus subcultured from a normal type stock, when cultured in a medium containing non-fermentable sugar, almost invariably ferments it by a process known as "entraînement." This newly-acquired property is temporary, but sometimes it can be transmitted for several generations as mentioned above.

P. H. M-B.

TANAKA (A.). **On a Non-Acid B. Dysentery.**—*Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. pp. 74–77.

A dysentery bacillus, in many ways resembling the organism described by SCHMITZ, was isolated in almost pure culture from two patients with dysentery and three with mild diarrhoea. This bacillus does not ferment mannite, but produces indol; like the SCHMITZ bacillus, it is only slightly toxic to rabbits, but is agglutinated in high titre by the patients' serum and is also clumped in low dilutions by Shiga serum and other dysenteric sera. *Per contra* the immune serum of this organism agglutinates feebly the already recognized strains of dysentery organisms.

P. H. M-B.

OLIVI (G.). **The Virulence of** *Bacillus metadysentericus* **(Castellani) in the Rabbit. Its Resistance to the Action of Sunlight.**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 16. Vol. 26. No. 8. pp. 123–124.

This bacillus resembles morphologically the classical organisms, but produces acid from many sugars, including lactose. It does not appear to be especially toxic to rabbits. Usually abscesses appear at the point of inoculation. An homologous serum can be produced, though the toxin appears to be similar to that of the Shiga-Kruse type as does the inflammation of the gut which results.

P. H. M-B.

FLU (P. C.). **Het gedrag van een inagglutinabele Bacterium Flexner tegenover bacteriophagen anti-Flexner.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leiden. 1923. Apr. 28. Vol. 8. No. 4. pp. 234–246. [English summary, pp. 247–248.]

——. **Das Verhalten eines inagglutinablen Flexner-Bakterium gegenüber Anti-Flexner-Bakteriophagen.**—*Cent. f. Bakt.* I. Abt. Orig. 1923. June 28. Vol. 90. No. 5. pp. 374–381.

From the intestine of a sprue patient an organism was obtained which showed all the properties of a Flexner bacillus except that it was not agglutinated by a Flexner anti-serum. This property remained constant after frequent subinoculations on agar. In spite of this, Flu considers the bacillus was a true Flexner, for, in the presence of an anti-Flexner serum, it fixed complement, and when injected into rabbits it produced a Flexner-agglutinating serum of a very high power.

Furthermore, this strain was quite resistant against bacteriophages having strong lytic qualities against other Flexner and Shiga strains. It was able to enter into combination with an anti-Flexner bacteriophage, either in the living or killed state. The inhibiting of the bacteriophage by this strain is probably due to the destruction of this substance by the living protoplasm of the bacillus.

P. H. M-B.

LISBONNE (M.) & CARRÈRE (L.). **Obtention du principe lytique pour le Bacille de Shiga par culture filtrée de** *B. coli.*—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 724–726. [4 refs.]

A lytic principle for Shiga's bacillus can easily be obtained by growing this organism in association with *B. coli,* but not with *B. pyocyaneus,* the staphylococcus or the cholera vibrio. A culture of *B. coli* is incubated in bouillon for five days and filtered through a Chamberland L.3 bougie ; 30 drops are then added to a fresh suspension of Shiga's bacillus in 9 cc. bouillon and again incubated for four days. At this stage the Shiga bacteriophage makes its appearance and can be reinforced by successive " passages."

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

ASH (J. E.). **Dysentery, with Reference particularly to the Laboratory Diagnosis, Epidemiology and Treatment.**—*Milit. Surgeon.* 1923. May. Vol. 52. No. 5. pp. 455–509. [12 refs.]

The author believes that a great many errors in the diagnosis of dysentery are still perpetrated. The Day of Judgment will see a mighty phalanx marshalled of those who succumbed to bacillary dysentery and were so unfortunate as to harbour at the same time one or other of the non-pathogenic amoebae and to be treated with emetine by the conservative physician who regards all amoebae as pathogenic ; there will also be a great many others in whom endothelial macrophages were mistaken for amoebae by the incompetent microscopist.

It has fallen to the author to enquire into so-called " epidemic amoebic dysentery," and he has failed to reach any conclusion that would vitiate the generally held view that amoebic dysentery does not become epidemic. There is little doubt that bacillary dysentery is more common in the United States than is generally recognized, and numbers of cases are incorrectly diagnosed and consequently mistreated. Most of the mistakes in the outbreaks the author has had to investigate have arisen from non-appreciation of the niceties of laboratory technique and ignorance of protozoology and cellular pathology. The examinations in many instances were relegated to an inexperienced orderly.

Bacillary dysentery shows a seasonal incidence in Manila, the curve culminating during the period of heavy rains. If, through mistaken diagnosis, mild bacillary cases are treated with emetine they usually do well, notwithstanding lack of specific treatment, thereby leading to the erroneous conclusion that the etiology of the condition has been established by a therapeutic test. Bacillary dysenteries of this type bear a close clinical resemblance to amoebic dysentery. The burden of establishing the final diagnosis rests upon the microscopist. To the untrained eye a large endothelial cell, particularly if it contains erythrocytes, immediately becomes an amoeba, and the fact that the microscopic field is strewn with necrotic epithelium and leucocytes conveys no suspicion that the process is bacillary.

It is highly probable that a considerable number of determinations of cysts of *E. histolytica* and *E. coli* made in laboratories are incorrect. In bacillary dysentery polymorphonuclear leucocytes are able to undergo karyorrhexis in which the chromatin breaks up into two or more annular bodies readily mistaken for nuclei of the amoeba type and consequently the leucocyte is identified as a cyst.

Serological results must be accepted with reserve ; experience shows that not a great deal of dependence can be placed on immunological reactions as a diagnostic test in bacillary dysentery. It frequently happens that during the active stage of the infection agglutinins are absent from the blood serum.

As regards carriers of *E. histolytica* the author is of opinion that there is no evidence at present that persons suffering from acute amoebic dysentery are able to transmit it to others. The dissemination is carried out by those who may never have suffered from even the slightest dysenteric symptoms—persons who may have harboured the organism for months or even years and are daily discharging in their stools great numbers of cysts, impossible of detection by any but microscopical methods. Unencysted amoebae leaving the intestine of man are incapable of infecting other people and quickly perish.

As illustrating the method of carrying out an investigation into the relation of the human carrier to dysentery, the following data are given of the examination of 375 food handlers on duty in various messes of the organizations where the " epidemic " of amoebic dysentery is said to have occurred. Of the 375 men (185 Filipinos, 140 Americans, and 50 Chinese), 290, or 77·3 per cent., were found to harbour one or more intestinal parasites ; 5·6 per cent. infections with *E. histolytica* were detected, apportioned as follows :—Americans 4·1 per cent., Filipinos 6·4 per cent., Chinese 6 per cent. Hookworm infections amounted to 39·7 per cent. of the entire number ; infections with *Trichuris trichiura*, 41 per cent. Six American food handlers were found infected with *E. histolytica*, and *none had ever previously suffered from dysentery*. The incidence of *E. histolytica* was scarcely high enough to warrant the assumption that they were spreading the infection to any considerable extent.

It is questionable whether it is necessary to examine the food handlers every month when the sanitation is good. Rather it would be better that such examinations be made less frequently, even only twice a year, but with greater thoroughness.

[This critical and instructive review of the fallacies that beset the diagnosis and treatment of dysentery in military organizations, or in private practice, common fallacies familiar to all who are interested in this subject, should be read in the original by those who are responsible for the direction of medical services in districts where " clinical dysentery " is rife.]

P. H. M-B.

WATSON (G. A.). **Report on Dysentery for the Year 1921.**—*Eighth Ann. Rep. of the Board of Control for the Year 1921. Lunacy and Mental Deficiency.* pp. 80–81. 1922. H.M. Stationery Office.

In the Lancashire County Mental Hospital 111 cases occurred, including one member of the male nursing staff. In 4 out of 41 cases of true dysentery, active forms of *E. histolytica* were found, *i.e.*, in 9·8 per cent. The remaining 37 were bacillary in origin, the Flexner Y and Flexner bacilli being found in 25 and 4 and the Shiga-Kruse bacillus in 6.

In 3 cases out of 313 new admissions, or nearly 1 per cent., the cysts of *E. histolytica* were discovered, and in 1 the Y strain of Flexner bacillus was isolated, but he had previously suffered severely from the disease.

P. H. M-B.

SHEARMAN (C. H.). **The Dysenteric Infections in Australia.**—*Med. Jl. Australia.* 1923. June 2. 10th Year. Vol. 1. No. 22. pp. 604–609. [8 refs.]

Dysentery was formerly considered not to be endemic in Australia. Considerable epidemics of bacillary dysentery have recently been reported and in this paper are summarized authentic records of amoebic dysentery and liver abscess in Australia. *E. histolytica* is not uncommon in the eastern goldfields. In 1922 the medical officer at Kalgoorlie reported 12 cases of hepatic abscess. The faeces of one of these was found to contain cysts of *E. histolytica.* Three patients with a similar infection were found in the Kalgoorlie hospital—two of the men were Australian born. The climatic and sanitary conditions in Kalgoorlie are favourable to the spread of the infection.

P. H. M-B.

DAVIS (C. Noel). **Dysentery in Shanghai. Recent Research.**—*China Med. Jl.* 1923. Feb. Vol. 37. No. 2. pp. 107–115.

——. **Some Recent Observations on the Pathology of the Dysenteries of Shanghai and its Bearing on Treatment.**—*Nat. Med. Jl. China.* 1923. Mar. Vol. 9. No. 1. pp. 27–35.

The material examined between June 30 and October 20, 1922, consisted of 214 specimens of faeces, all of which were investigated microscopically, and 100 by culture also; much of the material was not satisfactory. *Entamoeba histolytica* was found in 14, and in every case after September 15. Of the 100 specimens cultured, 50 were from typical, fairly fresh, uncontaminated dysentery stools; the other 50 were not nearly so satisfactory. Dysentery bacilli were isolated from 24 of the first lot, and from 14 of the second. Though the material investigated was not in the best condition, the author considers it safe to say that in Shanghai in 1922 bacillary dysentery was more prevalent than amoebic, particularly before September 15.

P. H. M-B.

LÄMPE. **Das weisse Blutbild bei Ruhr.** [The Leucocyte Picture in Dysentery.]—*Med. Klin.* 1923. Apr. 22. Vol. 19. No. 16. pp. 540–541.

The author has investigated the blood picture in 30 dysenterics, both during the acute stage and in convalescence, with an average of 10 examinations in each case. In the less severe cases there was a slight leucocytosis (8,500–18,000), and the count became normal after the appearance of normal motions ; the eosinophiles were 1–3 per cent., the large mononuclears 2–3 per cent. ; the lymphocytes were raised over the normal, 30–55 per cent. In 12 clinically severe cases it was as follows :—The leucocytes were increased from 7,000 to 22,000, the count becoming normal during convalescence ; the eosinophiles were reduced to 0, but increased even to 12 per cent. during recovery ; the proportion of lymphocytes was not raised during the acute stage, though in convalescence it reached 48 per cent. In the very severe cases (11) there was a most pronounced leucocytosis of 40,000, resolving shortly before death, the eosinophiles disappeared and the lymphocytes showed a relative diminution. In rapidly fatal cases the proportion of lymphocytes sinks very quickly ; it may be as low as 7–15 per cent. The cases investigated were either Flexner-Y or Shiga infections.

P. H. M-B.

LE ROY DES BARRES. **Complications chirurgicales des dysentéries.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. I. pp. 28–85.

Perforation of the colon with consequent peritonitis accounts for 12–15 per cent. of deaths from dysentery, especially amoebic dysentery, and has been recorded also in the balantidial variety. The perforation, which may be single or multiple, usually occurs in the caecum or sigmoid flexure. The peritonitis thus produced may be local or general according as it is shut off by adhesions or not. Generally speaking, there are few, if any, striking symptoms, and in some cases, generally of bacillary origin, no localizing signs of perforation at all with wide-spread infection of the peritoneum. On the whole surgical treatment is unsatisfactory save in those cases in which the peritoneal pus has become localized.

In chronic dysentery surgical intervention is undertaken either to treat the lesions locally or to place the large intestine at rest.

Resection of the colon in an enfeebled patient is not advisable, and the same may be said of entero-anastomosis. Left colotomy cannot be undertaken on account of the lesions being generally situated above this point. Colotomy is by no means so satisfactory as is *caecostomy*, and the formation of an artificial anus in the iliac fossa. The operation of *appendicostomy* has been attended by a considerable degree of success ; it is simple and rapidly performed. There are two forms of caecostomy opening, partial and complete ; the former does not differ materially from appendicostomy. The complete caecostomy permits of the diversion of the intestinal contents and thus keeps the large gut at rest. Usually the operation involves the removal of the appendix.

In the acute stage such major operations should not be attempted. In a sub-acute attack supervening upon the chronic form complete caecostomy should be undertaken and may be regarded almost as an emergency operation. In stenosis of the gut caecostomy is also justifiable, and, in addition, intestinal lavage is indispensable, for which the author recommends silver nitrate 1 : 4,000, or tannin with borate of soda. Before closing the caecostomy opening one should ascertain that the dysentery is completely cured, which is not always easy. Numerous factors must be taken into consideration, such as the number and appearances of the stools, the results of sigmoidoscopy, etc. It is usually necessary to wait 2–3 months after complete cessation of symptoms. The procedure of closing the wound varies according to circumstances, and attention is drawn to the value of thermo- and electro-cautery.

Typhlitis and perityphlitis are encountered in all forms of dysenteric ulceration and may lead to abscess formation and a similar affection of the appendix may co-exist. In the former case caecostomy is the only safe procedure.

Dysenteric appendicitis is usually amoebic in origin and associated with ulceration in other portions of the bowel, but a special form exists which may appear before the usual dysenteric symptoms. It is extremely difficult to diagnose true dysenteric appendicitis, especially in the acute condition, when the pain is not definitely localized. Dysenteric ulceration in the ascending, transverse and descending colon accompanied by inflammatory pericolitis may simulate and therefore be mistaken for malignant disease of the gut.

In the sigmoid three distinct processes may be distinguished, acute inflammation accompanied by oedema, suppurative perisigmoiditis and plastic sigmoiditis. Rectocolitis of dysenteric origin must be distinguished from arsenic or mercury poisoning and from syphilitic or tubercular ulcerations. The ulcerations in these cases can be treated by the application of silver nitrate through the sigmoidoscope. Other substances, such as dermatol, peroxide of zinc, etc., may be applied locally.

In extreme polypoid formation in the rectum, generally due to intestinal schistosomiasis, excision and curettage of the lesions is necessary, and sometimes extirpation of the whole of the mucosa by means of a Whitehead operation.

The etiology, symptoms, and treatment of liver abscess are discussed *in extenso*, but without novelty.

Amoebic abscess of the lung may originate either by direct extension through the diaphragm or in embolism due to septic absorption; in the latter case hepatic signs may be absent.

Other metastatic abscesses of possible amoebic origin are mentioned, such as those of the brain and kidneys. The author believes in the existence of a phagedenic condition of the skin, costal caries, ovaritis, salpingitis and mammitis due to *Entamoeba histolytica*.

The dysenteric arthropathies occur in 1–2 per cent. of bacillary cases, but the author does not mention any surgical remedial measures.

P. H. M-B.

COLE (Percival). **A Specimen of Colon, showing Multiple Perforations resulting from Dysentery.**—*Proc. Roy. Soc. Med.* (Section of Surgery). 1923. June. Vol. 16. No. 8. pp. 67–68.

The specimen was removed post-mortem from a female patient, aged 28, who had recently returned from a holiday in Germany, Switzerland and France. Sigmoidoscopy showed soft oedematous and papillomatous masses protruding into the lumen of the bowel. Emetine injections had no effect. The faeces were loose, tinged with blood, and contained shreds of mucus; microscopically there were epithelial cells, pus cells and many red cells.

The intestines were matted together and when separated numerous perforations, forming a lattice work, became visible. The interior of descending colon and sigmoid was covered by a number of plum-coloured excrescences arising from the mucous membrane. Microscopic examination showed considerable infiltration of the submucosa by mononuclear cells, and oedema. In the vessels and lacunae were seen numerous relatively large amoeboid cells, with well-marked nucleus and nucleolus, having the general appearance of *Entamoeba histolytica.*

[The determination of these cells does not appear to have been made by a protozoologist.]

P. H. M-B.

MORIN (Henry G. S.). **Syndromes dysentériques guéris par le seul traitement antihelminthique. Notes de clinique.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 330–336. [1 ref.]

During two years' work in Madagascar the author studied 66 cases of dysentery; the faeces were examined fresh, by the enrichment method of CARLES and BARTHÉLEMY, and were systematically centrifuged.

The frequent association of dysenteric symptoms with helminthic disease is emphasized; this occurred in 51 cases. The helminths were ascaris, trichocephalus, ancylostoma, *Taenia saginata*, and in six instances *Schistosoma mansoni*. There were five cases of amoebic dysentery, but, as no bacteriological examinations were performed, it is impossible to say what was the proportion of bacillary cases.

The symptoms rapidly cleared up after expulsion of the various helminths by means of appropriate drugs.

P. H. M-B.

WHITTINGHAM (Harold E.). **Observations on the Pathogenicity and Treatment of Flagellate Dysentery.**—*Brit. Med. Jl.* 1923. May 12. pp. 799–801. [19 refs.]

In the absence of proof to the contrary, Whittingham regards the intestinal flagellates—*Giardia, Trichomonas, Chilomastix, Tricercomonas*, and *Embadomonas*—as pathogenic. He agrees that the finding of an abnormal organism in the bowel of a neurasthenic subject is no proof; but no one can say that recurrent diarrhoea is a normal condition, nor are the flagellates normal inhabitants of the bowel. Giardia especially is associated with pale and pultaceous stools. Diarrhoea occurring in phlebotomus fever is to be attributed to these organisms, especially when they occur in the mucus. Many of his cases of pure "intestinal flagellosis" exhibited a distinct relative and absolute increase of the large lymphocytes and an eosinophilia of 5–8 per cent., possibly due to intestinal irritation. This irritation in turn may lead to neurasthenia. The symptoms thus produced are extremely serious to aviators.

The treatment adopted was vigorous. The patient was placed in bed on a light diet, and sodium bicarbonate, 15 gr., was given thrice daily, with the idea of clearing away the mucus from the intestinal canal; administration of calomel was followed, after catharsis, by thymol in three 30-gr. doses, succeeded by mag. sulph. in two potions. Immediately after the last a course of 33 gr. of emetine bismuth iodide was spread over a period of twelve days. During the fortnight following thymol treatment lavage of the colon was performed on alternate mornings with a solution of quinine sulphate in water (10–20 gr. of quinine to the pint). This was found most valuable in clearing away lumps of mucus containing large numbers of trichomonas and chilomastix. Subsequently the faeces were examined daily for at least three weeks, a purge being given at least once a week, and thereafter microscopic examinations were carried out at monthly intervals. In cases of relapse the E.B.I. treatment was repeated, and in a few cases a third course was undertaken. Cases which did not respond were regarded as incurable.

The results of this treatment are regarded as satisfactory; at least 50 per cent. of the giardia infections have cleared up and all the trichomonas cases, with one exception, have recovered.

P. H. M-B.

MAZZA (S.) & MERLO (E. N.). [**Efficacité du novarsénobenzol (Narsénol) par la voie buccale dans les flagelloses intestinales.**]—*Prense Med. Argentina.* 1922. Dec. 20. p. 591. [Summarized in *Bull. Inst. Pasteur.* 1923. July 15. Vol. 21. No. 13. pp. 524–525.]

In the treatment of diarrhoea associated either with the common intestinal flagellates alone, or concurrent with entomoeba, and even in the treatment of diarrhoea conjecturally referred to colitis or dyspepsia, the authors' experience is that the most intractable cases are cured by novarsenobenzol in coated capsules of 0·10 gm. 4 times a day.

A. Alcock.

i. VANZETTI (F.). [**Sulla colite cistica dissenterica.**] [Cystic Dysenteric Colitis.]—*Arch. per le sc. med.* 1922. Vol. 45. p. 43. [Summarized in *Med. Sci. Abst. & Rev.* 1923. Apr. Vol. 8. No. 1. p. 72.]

ii. BRAU (P.). **Les Dysenteries. Clinique et thérapeutique médicales. Complications Médicales.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 118–149.

i. Cystic proliferation of the glands of both small and large intestine in dysenteric colitis is here described. These cystic dilations do not, as a rule, lead to the formation of malignant new growths.

ii. A brief clinical account, laying stress upon treatment, but containing no new information.

P. H. M-B.

HAUDUROY (Paul) & ARSIMOLES. **Syndrome dysénteriforme produit par le bacille typhique guérison par le bactériophage du Dr. Herelle.**—*Progrès Méd.* 1923. Feb. 10. No. 6. pp. 61–62.

KASAI (Keijiro). [**On the Type of Dysentery Bacillus obtained in the Epidemic of Dysentery which broke out in Kyoto in 1921, with Special Reference to the Changes in the Agglutinability, Antigenic Property and Fermentation.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. of Japan Microbiol. Soc.*). 1922. Sept. Vol. 16. No. 9. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

THOMSON (J. G.) & ROBERTSON (Andrew). *Dientamoeba fragilis* **Jepps and Dobell, 1917. A Case of Human Infection in England.**—*Jl. Trop. Med. & Hyg.* 1923. May 1. Vol. 26. No. 9. pp. 135–136. With 1 plate.

WATANABE (Tai). **Serologische Untersuchungen an Shigabakteriophagen.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil Orig. 1923. June 22. Vol. 37. No. 1/2. pp. 106–147.

WHITTINGHAM (Harold E.). **Observations on the Pathogenicity and Treatment of Flagellate Dysentery.**—*Brit. Med. Jl.* 1923. May 12. pp. 799–801. [See this *Bulletin*, Vol. 20, p. 414.]

SPRUE.

SCOTT (H. Harold). **A New Theory as to the Causation of Sprue and the Results of Treatment based thereon.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 475–477.

Impressed by the similarity between some of the symptoms of sprue and those of other diseases in which calcium deficiency, or disordered calcium regulation, plays a part, Scott had the opportunity of putting theory into practice in the actual treatment of a case. The work of VINES has shown that calcium is present in the blood in two forms, the combined or "coagulative" and the "ionic," and the metabolism of calcium appears to be controlled by the parathyroids. Treatment by calcium alone led merely to a partial and temporary improvement, but, when combined with parathyroid medication, the results were most striking. The cramps, the soreness of the mouth, the acidity and flatulence rapidly disappeared and the stools for the first time for two years regained their normal colour; the patient rapidly put on weight and regained his normal health. The theory that Scott propounds is as follows:—

In the endemic areas of the disease the conditions are such that there is an excessive proteid or fatty diet, or the method of cooking the food may lead to an acid dyspepsia. Excess of proteids stimulates an over-production of acid in the gastric juice and may lead to habitual over-acidity. The entrance of acid into the duodenum stimulates the production of secretion, which in turn leads to over-stimulation of the pancreas and secondarily to an upset in the balance of the endocrine glands. Evidence is accumulating that endocrine disturbance and alimentary toxaemia are frequently associated; also all acute and chronic toxaemias react in some degree upon the parathyroids, causing disturbance of calcium metabolism. The stimulation of pancreatic function is shown by the analyses of sprue stools. Normally, neutral fats present are to fatty acids in the proportion of 1 : 2, but in pancreatic disease this ratio is reversed and may be 15 : 1. In sprue, however, more splitting up of neutral fat takes place, the proportion of neutral to fatty acids being 1 : 3 to 1 : 5.

P. H. Manson-Bahr.

LAMBERT (S. M.). **A Personal Experience with Sprue.**—*Jl. Amer. Med. Assoc.* 1923. June 30. Vol. 80. No. 26. p. 1910. [1 ref.]

The author contracted sprue in Queensland in 1919 and treated himself with hydrochloric acid and pancreatin, his attention having been drawn to this method by the article by BROWN [see this *Bulletin*, Vol. 9, p. 197]. The dosage consisted of 15 minims of 0·2 per cent. hydrochloric acid before and 10 gr. of pancreatin after each meal, no dietary precautions being observed. He so rapidly improved that he was able to remain in the endemic centre without return of symptoms for another year. This treatment is now being generally adopted along the Queensland coast.

P. H. M-B.

ASHFORD (Bailey K.). **A Clinical Investigation of Tropical Sprue.**—*Amer. Jl. Med. Sci.* 1923. Feb. Vol. 165. No. 2. pp. 157–173. With 6 figs.

The principal factors in the production of the complex symptoms of sprue are glandular insufficiency and colonization in the digestive tube of a superimposed specific organism—*Monilia psilosis.*

The usual sequence of events in sprue as it occurs in Porto Rico is as follows :—

A physiological glandular deficiency due to hereditary depression of cellular vitality, long continued exposure to a tropical climate, lack of healthful exercise, of sufficient sleep and suitable food, an ill-balanced diet composed of inordinate quantities of vitamin-deprived cereals, sweets and fat, previous wasting diseases, such as dysentery, malaria and syphilis. The gradually developed symptom-complex which follows these predisposing causes includes: asthenia, acid dyspepsia, flatulence, constipation, shrinkage of the liver, loss of appetite, disorders of menstruation, pigmentation of the skin, etc. The gradual or abrupt development of sore tongue and large white frothy motions are associated with an increase of all the symptoms of glandular deficiency. In the "borderland cases" between incomplete and complete sprue a clinical diagnosis without positive laboratory findings is practically impossible.

Although this sequence of events is general, exceptions are by no means rare. In a third of the author's cases food deficiency played no part whatsoever. Twelve per cent. of cases were negative "mycologically" and "serologically"; such were usually old chronic cachectic cases. These are in a state of extensive glandular atrophy as a result of sprue and no surprise need be exhibited at the failure to demonstrate *Monilia psilosis* in them. In some undoubted cases of sprue in a state of quiescence, neither can the serological reaction be substantiated nor can the *Monilia* be isolated. Arguing from the analogy of syphilis and tuberculosis both these classes of cases are quite intelligible and they seem to furnish the "scanty material" on which the author's conclusions as regards the etiology of sprue have been criticized. The fact that only 1·5 per cent. of inhabitants of the endemic zones of sprue harbour *Monilia psilosia* without showing any signs of disease, whilst 87·6 per cent. of the author's sprue cases are heavily infected with it, bears out his contentions that this organism is the cause of the disease.

In 1920 a set of questions was prepared covering all the usual clinical phenomena observed in sprue ; the list of symptoms is a long one.

The author's "mycologic" series extends from 1914–17 and consists of 476 cases, of which 246 were clinically sprue. His whole series comprises 1,572 cases. The term incomplete sprue apparently applies to cases without marked digestive disturbances and in a series of 1,309 cases we learn that in 12 per cent. there were no clinical phenomena. These statistics have been tabulated and illustrated by graphs or fans, the points in each fan bearing a number corresponding to symptoms already explained in the text. For their interpretation the reader is referred to the original paper.

In 1916–17 the complement deviation test was applied for diagnosis and 88 of the 225 cases of sprue were thus examined : 20 which had been mycologically negative were shown to be serologically positive. In the mycologic series the four cardinal symptoms were grouped in 211 cases. Cases with typical raw tongue and frothy white diarrhoea constituted 48 per cent. Cases with typical raw tongue, with or without diarrhoea, 53 per cent. Cases with tongue raw at tip and edges, with or without diarrhoea, 11 per cent. Cases in whom only a sensation of burning was felt, with or without diarrhoea, 22 per cent. Cases with both sore tongue and diarrhoea, 83 per cent. Cases with one or other above symptoms, 13 per cent. Cases with neither one nor the other, 4 per cent. The net result of this investigation is summarized in these figures :—

1. Of the 616 cases of sprue, 453 were examined by laboratory methods and 86 per cent. yielded a positive finding for *Monilia psilosis.*
2. Of the 259 cases of glandular deficiency, 124 were examined by laboratory methods and all were negative for *Monilia psilosis.*

Throughout this paper the *Monilia psilosis* is frankly recognized as the " causal organism."

There are numerous tables in the text which are too complicated to admit of adequate summary and therefore should be consulted in the original.

P. H. M-B.

SCHAEFER (Hans). **Ein Fall von nichttropischer Sprue.** [A Case of Non-Tropical Sprue.]—*Klin. Woch.* 1923. June 11. Vol. 2. No. 24. pp. 1121–1122. [4 refs.]

The author here describes a case of sprue, or sprue-like disease, in a woman of 21 who had never been out of Germany. The illness began in 1918 with dysentery, followed by dyspeptic symptoms and wasting. The stool soon acquired all the well-known characters of a sprue motion. Anaemia of the aplastic type also gradually developed. With treatment for achylia gastrica and pancreatic disturbance improvement took place, but was followed by a relapse a year afterwards with inflammation of the tongue and aphthae on the mucous membranes. The author considers that there can be little doubt about the diagnosis and quotes the cases recently described by NOLEN and TALMA (Utrecht) and VAN DER SCHEER in Holland, also one recorded by BEGG in England.

P. H. M-B.

TIDY (H. Letheby). **Blood Picture in Sprue.** [Correspondence.]—*Brit. Med. Jl.* 1923. Apr. 28. p. 743.

Blood changes are not infrequent in sprue and may be indistinguishable from those of pernicious anaemia and yet recovery occur. Not much attention seems to have been paid to the blood changes and achlorhydria in colitis and sprue, though these are obviously important points in treatment.

P. H. M-B.

ASHFORD (Bailey K.). **Investigaciones clinicas sobre el Espru de los Tropicos.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 1–26. With 6 text figs.

CHOLERA.

i. PONDMAN (A.). **The Way in which Cholera-Vaccin is prepared at the Pasteur Institution at Weltevreden.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 324–330.
ii. NIJLAND (A. H.). **Results of the Vaccination against Typhoid Fever and Cholera in the Dutch-Indian Army.**—*Ibid.* pp. 593–604. With 10 text figs.
iii. SNIJDERS (E. P.). **On the Localisation of the Bacilli in Carriers of Typhoid, Paratyphoid, Dysentery and Cholera.**—*Ibid.* pp. 333–340. [2 refs.]

i. Anti-cholera vaccine has been prepared in this institution since 1910. The author draws attention to the years 1918–19, when an extensive cholera epidemic prevailed in Java. " By vaccinating the population systematically with 1·0 cc. of vaccine, repeated after six months, we succeeded in removing the epidemic."

ii. A chart shows that for five years previous to the introduction of anti-enterica vaccines morbidity was 10·1 per 1,000 troops ; mortality 1·5 per 1,000. For the five years after the introduction of vaccines the figures are : morbidity 4·7 per 1,000 and mortality 0·5 per 1,000.

For cholera a similar improvement is shown. Anticholera vaccines were first employed in 1911. For nine years previous to that date the cholera morbidity per 1,000 troops was 1·13, the mortality 0·29. For the nine years following 1911 the figures were 0·45 and 0·13.

iii. The author records results of laboratory work from 1914 onwards.

J. H. Tull Walsh.

DEL ROSARIO (S. V.) & RIZAL (L. Lopez). **Some Epidemiological Features of Cholera in the Philippines.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 406–420.

" The agglutinating property of cholera vibrios may be lost or regained under unknown circumstances in cases and carriers, as well as *in vitro.* The loss of agglutinating property of any strain may be taken as an index of a condition of degeneration. The increased occurrence of non-agglutinating vibrios among cases and carriers, means low case fatality."

" As a part of the preventive campaign against the disease it would be unwise to ignore or disregard the existence of the so-called ' non-agglutinable vibrios,' and failure to isolate, quarantine or disinfect persons or things so infected or liable to such infection would be a distinctly dangerous omission." (Ann. Rep. Philippine Health Service, 1917.)

J. H. T. W.

TOMB (J. W.). **A Note on an Investigation into the Value of Essential Oils in the Prevention and Treatment of Cholera.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 257–259.

The author is Chief Sanitary Officer, Asansol Mines Board of Health. Owing to severe annual outbreaks of cholera on the coalfields of Bengal this Board was instituted in May, 1916. The area comprised in the mining settlements is 413 square miles, with a population of 329,353 (1921 census), to which must be added a floating population not less than 125,000. Outbreaks of diarrhoea and cholera in villages must be treated at once with drugs always ready. A mixture based on the following formula was brought into use :—

Spt. Aether	m/30
Ol. Cloves, Ol. Cajuput, Ol. Juniper	āā m/5
Acid Sulph. Aromat	m/15

Dose.—One drachm in half an ounce of water, every half-hour until vomiting and purging cease. (This generally takes place after five or six doses.)

For Contacts.—One drachm in water, once (or twice) daily for one or two days.

The mixture can easily be made in bulk ; it is cheap and pleasant to take. It " has now been administered to several hundreds of such contacts, and in no instance has any case of cholera developed amongst them, although, as we have seen, the number of cases normally to be expected is not less than 50 per cent. of the number of original cases. . . . One dose of the mixture daily to those immediately exposed to such infection, would seem to be a certain preventative of the development of the disease." The curative value of the mixture in all stages of the disease, short of collapse, is not to be lost sight of, the death-rate of those treated in the Mining Settlements being 16·6 per cent. up to date. For most of these village cases saline injections were out of the question as being only suited for use by a trained medical staff, which the Board does not possess.

J. H. T. W.

SANARELLI (G.). **De la pathogénie du choléra (septième mémoire). Voies de pénétration et de sortie des vibrions cholériques dans l'organisme animal.**—*Ann. Inst. Pasteur.* 1923. Vol. 37. No. 4. pp. 364–395. [45 refs.]

[For previous memoirs see this *Bulletin*, Vol. 19, pp. 379 and 736.]

The experiments described have led to the following conclusions :—

1. In adult rabbits and guinea-pigs vibrios injected into the peritoneal cavity pass rapidly into the circulation and thence to the walls of the intestines.

2. Excretion of vibrios by the intestines, in rabbits, begins a few minutes after the injection, ceases, as a rule, after the twelfth hour, but sometimes may continue for several days.

3. The gastric contents of rabbits and guinea-pigs are so acid that they kill vibrios in two minutes and germs given by the mouth do not pass into the intestines through the stomach.

4. Cholera vibrios spread on the buccal mucous membrane of adult rabbits can pass through the epithelial covering and reach the intestines either through the lymph or the blood circulation.

5. Having arrived in the intestines (4), the vibrios provoke serious chronic changes.

6. To show this passage through the buccal mucous membrane it is wise to employ old cultures, those rich in spheroidal forms.

8. The naso-pharyngeal mucous membranes of adult rabbits and guinea-pigs are even more permeable to vibrios than that of the mouth.

10. The respiratory mucous membrane is also permeable.

12. In adult rabbits which die slowly of intestinal cachexia caused by vibrios injected into the peritonium, nose or trachea, or administered by the mouth, very few vibrios are ultimately found.

J. H. T. W.

IACONO (Igino). **Su un nuovo metodo per la rapida diagnosi dell' infezione colerica.**—*Riforma Med.* 1923. Feb. 5. Vol. 39. No. 6. pp. 121–123.

This paper is not concerned with clinical diagnosis, but with differentiation of cholera vibrios in the laboratory. The greater part is occupied by an enumeration and review of the various methods of culture, etc., already in use. Dr. Iacono's method is based on the serum absorption method which CASTELLANI advocated for differentiation of typhoid and paratyphoid bacilli. The necessary sera are obtained from rabbits.

[For differentiation of *V. cholerae*, see also this *Bulletin*, Vol. 18, pp. 70–71, " Recent Advances, etc."]

J. H. T. W.

NOURY (Osman) & ALALOU. **L'action de quelques vibrions cholériques sur les sucres.**—*Bull. sanitaire de Constantinople.* 1923. Jan. Nos. 5 & 6. pp. 45–48.

The authors have examined the reaction of several atypical strains of *V. cholerae* [called paracholera varieties by some bacteriologists] upon various sugars with the results shown in the following table :—

Cholera Vibrios of Russian Origin and Recently Isolated, agglutinating at 1/6,000.

Name of Strain.	Glucose.	Levulose.	Maltose.	Saccharose.	Lactose.	Inulin.	Mannite.
Tchilinguir 6	+	+	+	+	0	0	0
Cavak 6	+	+	+	+	0	0	0
Cavak 20	+	+	+	+	0	0	0
Cavak 22	+	+	+	+	0	0	0
Cavak 25	+	+	+	+	0	0	0

Cholera Vibrios from Various Sources, agglutinating at 1/5,000 or 1/6,000.

Egyptien 38	+	+	+	+	0	0	0
Annamite	+	+	+	+	0	0	0
Schoerter	+	+	+	+	+	0	0
I.P.C.	+	+	+	+	+	0	+

Non-Agglutinating Vibrios from Various Sources.

Massaouah	+	+	+	+	0	0	0
Tor	+	+	+	+	+ (slight)	+ (slight)	+
Deneke	+	+	+	+	0	0	0
V. Metchnikovi ..	0	±	+	+	0	0	0
V. Phosphores ..	0	+	0	0	+	0	0
X.7	+	0	0	0	+	0	0

Most of the strains produce no effect on lactose, inulin and mannite ; but strains which, like " El Tor " produce haemolysis in blood-cultures, seem able to decompose these three sugars. The authors describe their methods, and, wisely, give the commercial, or laboratory, origins of vibrios and of the various sugars.

J. H. T. W.

SHIIBA (Yoshiya) & USHIJIMA (Tomoki). **[On the Nature of Cholera Vibrios, with Special Reference to the 1921 Strains.]**—*Chosen Igakkai Zasshi* (*Jl. Korean Med. Soc.*). 1922. Dec. No. 40. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 59.]

Out of 20 strains tested by the authors one, only, failed to give the "Cholera red" reaction. Many showed haemolysis in blood (goat, pig, etc.) agar cultures, but this property varied when the vibrios were first cultivated in peptone water or broth to which goat or horse erythrocytes were added. All the 1921 strains were of slight virulency. The Korean, Moji and Kanagawa strains were typical; the Nagasaki strain atypical.

J. H. T. W.

MANWARING (W. H.), BOYD (W. H.) & OKAMI (S.). **Study of Bacterial Products by Means of Excised Mammalian Heart. I. Endotheliotoxin of** *S. cholerae.*—*Jl. Infect. Dis.* 1923. Apr. Vol. 32. No. 4. pp. 307–308. With 1 text fig. [2 refs.]

"Filtrates from broth cultures of *S.* [*V.*] *cholerae* are almost nontoxic for the conducting and contractile tissues of the excised rabbit heart. The filtrates, however, are markedly toxic for the capillary endothelium, producing striking myocardial edema and diapedesis."

J. H. T. W.

i. GOODPASTURE (Ernest W.). **Histopathology of the Intestine in Cholera.**—*Philippine Jl. Sci.* 1923. Apr. Vol. 22. No. 4. pp. 413–424. With 1 plate. [5 refs.]

ii. ——. **A Poisonous Constituent in Cholera Stools.**—*Ibid.* pp. 439–445. [2 refs.]

i. Requires no detailed notice.

ii. The author's experiments show that a substance precipitated by alcohol from the watery stools and intestinal contents from cholera cases is very poisonous to dogs. The experiments are described in detail.

J. H. T. W.

GILDEMEISTER (E.) & HERZBERG (Kurt). **Ueber den Wert des Kartoffelstärkepeptonwassers nach Kodama und Takeda für die praktische Cholera-Diagnose.** [Value of Starch Peptone Water in Cholera Vibrio Diagnosis.]—*Cent. f. Bakt.* 1 Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. pp. 53–55.

Reviewing and repeating the work of the Japanese bacteriologists, Gildemeister and Herzberg conclude that some strains of *V. cholerae* do not produce sufficient diastase ferment to react in a manner reliable for practical diagnosis of the cholera vibrios [v. KODAMA & TAKEDA, this *Bulletin*, Vol. 19, p. 380].

J. H. T. W.

PUNTONI (V.). **Sopravvivenza decennale del vibrione colerico conservato in liquido peritoneale.** [Survival of Vibrios for Ten Years in Peritoneal Fluid.]—*Ann. d' Igiene.* 1923. May. Vol. 33. No. 5. pp. 321–324. [1 ref.]

The vibrios were taken from :—(1) a guinea-pig inoculated 1912 ; (2) a guinea-pig inoculated with the same vibrios October, 1912 ; (3) guinea-pigs inoculated with the "El Tor" variety of cholera vibrio, November, 1912 ; (4) guinea-pigs inoculated with a Massaua strain, November, 1912. Cultivated in agar and peptone water 1, 3 and 4 were found sterile ; but from No. 2 about 100 colonies grew on agar. These retained virulence for guinea-pigs.

J. H. T. W.

D'HERELLE (F.). **Sur un "Principe bactériolysant," non bactériophage, existant dans l'intestin des cholériques.**—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 723–724.

Describes the experimental finding of a body able to dissolve *V. cholera* :—

"This substance appears in the stools from 3–4 days after the onset of the disease and persists up to the time of death. . . . In a convalescent I was able to follow this substance from the onset up to the sixteenth day."

J. H. T. W.

KABESHIMA (Tamezo). **[Choice of Immune Reactions for the Purpose of the Diagnosis of Cholera Vibrios.]**—*Kaigun Gun-i-Kwai Zasshi* (*Proc. Navy Med. Corps.*). 1922. Oct. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

——. **[On the Biological Nature of Cholera Vibrio, which was Isolated from Cases occurring in Fukuoka in 1922.]**—*Ibid.* [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

MAYMONE (Bartolo). **[Le attività biochimiche del vibrione colerigeno.]**—96 pp. Salerne : Impr. Jovane. [Summarized in *Bull. Inst. Pasteur.* 1923. May 31. Vol. 21. No. 10. pp. 379–380.]

PLAGUE.

i. Van Steenis (P. B.). **The Way in which Plague spreads over Java.** —*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 566–583. With 2 folding maps. [5 refs.]
ii. Otten (L.). **Lecture on Plague.**—*Ibid.* pp. 617–628. With 3 plates & 1 chart.

i. The following four means by which infection spreads are given by the author :—(1) plague bacillus in ground dust, food or on articles for daily use ; (2) man suffering from plague ; (3) rat suffering from plague ; (4) flea carrying the bacillus. Map I shows how infection may travel along railways or tramways ; Map II shows the dates of local infection (1919) and the number of plague cases.

ii. A general account of plague, with special reference to outbreaks in Java. The plates show sanitary staff disinfecting a village, with evacuation during disinfection.

J. H. Tull Walsh.

Van Steenis (P. B.). **Epidemiologische studie van de pestepidemie te Solo (Soerakarta) Maart 1915–April 1916.** [Epidemiologic Study of the Plague Epidemic at Solo-Soerakarta (Java), March 1915–April 1916.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 285–302. With 4 maps. [3 refs.]

Though he cannot give the actual proof of his views, the author makes it probable that in this epidemic the local spreadings were caused by an epizootic of *M. rattus*, whilst the metastatic spreading over longer distances was brought on by an epizootic of *M. decumanus*, living along the river sides and in the town drains. Often public markets where *rattus* and *decumanus* meet were the centres of new extensions.

W. J. Bais.

Salm (A. J.). **De pestepidemie in Blitar in 1921–22.** [The Plague Epidemic at Blitar (Java), 1921–22.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 73–88. With 1 map & 1 chart in text.

A clear account of this epidemic. After some minor outbreaks in 1911, 1913, 1915, 1916 and 1917, 60 cases, with 58 deaths, occurred from October, 1921–January, 1922. Other cases probably occurred before the disease was recognized. There were four cases of pneumonic plague (one secondary).

W. J. Bais.

Mora (A. Damas) & others. **A pandemia de peste durante o ano de 1921. As epidemias de Angola em 1921–1922.** [Pandemic Plague in 1921. Plague in Angola (1921–22).]—*Rev. Méd. Angola.* 1922. Sept. No. 3. pp. 7–132. With 1 map.

This is a sequel to the report on plague in Loanda already reviewed [this *Bulletin*, Vol. 19, p. 368].

A table is given showing the prevalence of plague in various countries in 1921. Next follow descriptions of the outbreak in different districts of Angola in 1921–22, namely Catete (May, 1921–March, 1922), Melanje (November, 1921–May, 1922), Novo Redondo (November, 1921) where there had been a high rat mortality in the preceding August, Mossamedes (February–April, 1922); here there were 116 cases, with 82 deaths (70·69 per cent.), and more than half were between the ages of 11 and 25 years. In Benguela there were 44 cases, of whom 26 died. Loanda was the seat of a second epidemic in September–November, 1922; there were 90 cases, with 42 deaths, and all were bubonic. Those with axillary buboes ran a more severe course and accounted for most of the fatalities [v. this *Bulletin*, Vol. 19, pp. 543–544].

Preventive measures consisted in disinfection of dwellings with sulphur, mainly by Clayton's apparatus, and the administration of anti-plague vaccine. At first a dose of 0·5 cc. was given, but better results appear to have been obtained with a larger initial dose, 1 cc., which produced a marked reaction "simulating an attack of plague." In severe cases serum was injected in doses of 40–60 cc. intravenously.

Anti-plague vaccine from the Paris Pasteur Institute was used for treatment.

H. Harold Scott.

i. LEGER (Marcel) & BAURY (A.). **De la peste chez les Muridés et les Musaraignes à Dakar.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 133–137. [3 refs.]

ii. —— & ——. **De l'emploi de la Chauve-Souris comme animal réactif dans la peste.**—*Ibid.* pp. 78–79. [9 refs.]

i. A detailed account with tables of examination of rodents and shrews [see this *Bulletin*, Vol. 19, p. 367 (LEGER & BAURY)].

ii. The authors record that the bat, *Nyctinomus pumilus*, is very sensitive to Yersin's bacillus. Intraperitoneal inoculation of *B. pestis* is followed by death in 28 hours, intranasal in 36, and intramuscular in 30 hours. Bacilli are found in all organs. [Bats do not, so far as we know, die naturally of plague.]

J. H. T. W.

MATHIS (C.). **La Musaraigne, réservoir de virus pesteux au Cambodge.** —*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 158–159. [1 ref.]

Confirms KERANDEL's statement that *Crocidura murina*, when dwelling among rats suffering from plague, can be infected by fleas which quit dead rats for living shrews. In one dead shrew examined by the author *B. pestis* was found in the spleen. Among 24,460 animals captured during sanitary destruction of rats, in Cambodia, Dr. MENANT counted 2,508 shrews [*cf.* LEGER & BAURY, this *Bulletin*, Vol. 19, p. 367].

J. H. T. W.

CHAMBERLAIN (E. Noble). **A Small Epidemic of Plague.**—*Brit. Med. Jl.* 1923. May 26. pp. 896–897.

Describes an outbreak of plague on a ship sailing from Karachi to Liverpool. There were six cases, all fatal, among the lascar crew;

no Europeans were affected. Case six was one of virulent pneumonic plague; the other five showed inguinal buboes. Anti-plague serum was not available until the ship reached Dunkirk. Case No. 5 occurred at this time and the man (with temp. 104° F. and delirious) received 50 cc. daily from March 24 to March 31, when he died. The crew received each 10 cc. of the serum as a prophylactic, and subsequently 1 cc. of anti-plague vaccine. After vaccination no further cases occurred. The cases occurring before Dunkirk was reached were treated with Tr. Iod., and the tincture was also injected into the buboes. [See this *Bulletin*, Vol. 20, p. 362 (JOLTRAIN and DE GENNES).]

J. H. T. W.

TANON (L.) & CAMBESSÉDÈS. **Les formes liminaires de la peste et la question du bubon climatique.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 65–74. [Refs. in text.]

The term " climatic bubo " is most unfortunate for, setting aside buboes due to venereal infection and due to streptococci gaining entrance through wounds in the leg, most of these belong to mild cases of plague. The authors regard RAVAUT's opinion as to such buboes being lymphogranulomata as " too absolute." [v. RAVAUT, this *Bulletin*, Vol. 18, p. 297].

" To admit that every bubo called climatic, of slow progress, healing always with or without suppuration and without general reaction is a lymphogranuloma and not due to plague, lays one open to mistakes, since we run the risk of overlooking latent and dangerous cases not suspected..

" Climatic bubo does not represent a well determined malady but a symptom of slow gland infection, nearly always in the groin and due to various pathogenic causes.

" For our part we observed during the course of the small outbreak in Paris during 1920 [v. this *Bulletin*, Vol. 20, p. 362 (JOLTRAIN)] numerous cases of sub-acute adenitis in which plague infection could be demonstrated and which gave the clinical picture of ' climatic ' bubo."

M. GRAVELLAT (discussion) drew attention to the necessity for seeking out the plague bacillus in all cases of adenitis among the indigenous troops, even when the cases appeared trivial. It is useful to warn medical officers of the possibility of plague buboes being benign in so far that bacilli may be absent.

J. H. T. W.

TSURUMI (Sanzo), HARA (Chikawo), SAKAMOTO (Tokuichiro), IMAI (Minoru) & AOKI (Tsutomu). [**Studies on Pulmonary Plague.**]—*Nisshin Igaku* (*Progress in Med.*). 1922. Nov. Vol. 12. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 61.]

1. The distribution of the bacilli in the cadaver was so restricted in two out of 13 cases that all viscera and the heart blood were free from *B. pestis*. In these two cases bacilli were found only in the lungs.

2. From the point of view of pathology and histology pneumonic plague may be divided into two forms:—(1) haemorrhagic serous

pneumonia, and (2) cellular effusive pneumonia; with intermediate forms. (1) is lobular and the foci are united, so that the entire feature appears as diffuse red 'hepatic' degeneration, while (2) is chiefly lobar greyish-white degeneration.

3. By injecting bacilli directly into the air passages, or into the lung tissues, plague pneumonia could be experimentally produced in guinea-pigs and rabbits [*cf.* this *Bulletin*, Vol. 19, pp. 372–373 (WU LIEN TEH)].

J. H. T. W.

LHUERRE (H.) & LEGER (M.). **Sur un cas de peste pulmonaire à évolution atypique.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 203–207. [3 refs.]

The authors draw a wise line between pneumonia and broncho-pneumonia arising as secondary complications in cases evidently bubonic in origin. The interesting case which they give with full details may be thus abridged:—

Sikhon Kamera, admitted to hospital January 9, 1923, with "suspected broncho-pneumonia"; fine crepitant râles all over the lungs; temp. 37·5° C.; resp. 34; sputum blood stained. No enlargement of glands. Examination of sputum showed cocco-bacilli resembling *B. pestis.* No tubercle bacilli found. For ten days the condition remained unchanged, and then the patient appeared worse, with drawn features, intense dyspnoea and temp. 38·9° C.; pulse irregular and soft. Sputum markedly bloody; râles increased. *B. pestis* was found not only in the sputum, but also in fluid taken from an apparently normal gland in the groin. Anti-plague serum was injected, 100 cc. (intravenous), on January 25, and again on January 26 [such small doses are not of much value, and so far as the record goes no more was given]. The patient died on February 11. The diagnosis of plague was confirmed by experiments on mice and on a grey rat.

Dr. ACAR stated that such sub-acute cases of pneumonic plague were more common than is generally supposed. He had cured similar cases with anti-plague serum. Such anti-plague treatment is urgent and should be given as soon as a suspicious cocco-bacillus is seen in the sputum. It is not wise to wait for further confirmation; the remedy may arrive too late, as in the case reported.

J. H. T. W.

NOGUE (M.). **Un cas de méningite pesteuse.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 378–381. [4 refs.]

A Senegalese gunner, aged 40, was admitted into the Colonial Hospital, Dakar, on February 1, suffering from pneumonia. On the 24th there was a rapid rise of temperature to 39° C., with pain in the lumbar region and incessant groaning. A lumbar puncture showed cocco-bacilli resembling plague germs. Similar bacilli were obtained from an apparently normal inguinal gland. On February 26 anti-plague serum, 100 cc., intravenous; repeated on the 27th. The man died that night. After autopsy plague bacilli were found in the pneumonic lungs and in the bronchial lymphatic glands. The cranium was not opened.

J. H. T. W.

TEISSIER (P.), GASTINEL (P.) & REILLY (J.). **De quelques documents anatomiques concernant la peste bubonique (Epidémie Parisienne. Exposé des faits (Premier mémoire).**—*Jl. de Physiol. et de Path. Génér.* 1923. Vol. 21. No. 1. pp. 104–116. [2 refs.]

——, —— & ——. **Principaux caractères anatomiques de la peste bubonique—considérations générales. (Deuxième mémoire.)**—*Ibid.* pp. 123–131. With 10 figs. [2 refs.]

These papers contain a careful study of the conditions found in fatal cases. As the gross and microscopic anatomy is recorded in textbooks, detailed notice is not necessary.

[For reference to the Paris epidemic, see this *Bulletin*, Vol. 20, p. 362 (JOLTRAIN).]

J. H. T. W.

FUSCO (G.) & PATANE (C.). **Ancora sulla fine struttura del bacillo della peste.**—*Pathologica.* 1923. Apr. 15. Vol. 15. No. 346. p. 253. [4 refs.].

The authors point out that there have been described certain granules seen in the body of *B. pestis* when stained with ammoniacal solution of methylene blue.

Their observations show that these granules can be generally demonstrated in bacilli from cultures or sometimes in those taken direct from a plague bubo. They are easily found in bacilli grown on ox serum solidified with 15 per cent. glucose. Similar granular structures can be seen in certain allied germs, such as the pseudotuberculosis bacillus of rodents, if grown and stained by the methods described.

[*Cf.* this *Bulletin*, Vol. 17, McCOY, p. 388 ; SMILLIE, p. 398 ; Vol. 18, EPSTEIN, p. 376 ; and PICCININI, p. 730.]

J. H. T. W.

i. LAVANDERO (R.). **Observaciones clinicas y tratamiento de la Peste Bubónica durante la epidemia del 1921.** [Clinical Signs and Treatment of Bubonic Plague.]—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 40–49. With 1 fig.

ii. GIULIANI (S.). **Examen de los esputos practicados en el Laboratorio Biológico durante la epidemia de Peste Bubónica en Puerto Rico, 1921.** [Examination of Sputum in the Laboratory during an Epidemic of Bubonic Plague.]—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 61–63.

iii. LEGER (Marcel) & BAURY (A.). **Souche pesteuse isolée des porteurs sains humains et sa virulence comparée.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 54–57. [5 refs.]

iv. WICKERSHEIMER (Ernest). **Les recettes de Philippe Melanchthon contre la peste.**—*Janus.* 1923. Jan.–Feb. Vol. 27. No. 1. pp. 1–7. [26 refs.].

v. ACAR (M.). **Evolution de la peste au Sénégal.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 372–373.

i. The author describes, in detail, the clinical symptoms observed during the epidemic. He found anti-plague serum of great value and rightly insists on large doses given early :—250 to 500 cc. during the day.

ii. Describes the methods and stains used during routine examinations of sputum for detection of *B. pestis*, tubercle bacilli, etc., and to distinguish between Gram-positive and Gram-negative germs.

iii. A study of the comparative virulence for rodents of strains of plague bacilli isolated from healthy carriers.

iv. Of historical interest, especially to botanists.

v. See this *Bulletin*, Vol. 17, p. 390 (Esquier); p. 391 (Ambrose).

J. H. T. W.

Chawla (Gopal Singh). **A Case of Oedema of the Leg following Plague.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. p. 120.

Nikanoroff (S.). **Les épidémies de peste au sud-est de Russie en 1922-1923.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. [In Russian, pp. 38–41. Abridged Version in French, pp. 91–92.]

Ortiz (Pedro N.). **Puntos fundamentales en el diagnóstico de la Peste Bubónica.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 56–61. With 1 fig.

Otero (P. Morales). **Estudio epizotico de la epidemia de Peste Bubónica en Puerto Rico, 1921.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 49–56. With 2 figs.

Souvoroff (S.). **L'épidémie de peste dans la commune Fédocéevka de l'arrondissement de Kalmouk.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. [In Russian, pp. 70–73. Abridged Version in French, p. 96.]

Wu Lien Teh, Chun (J. W. H.) & Pollitzer (R.) **Clinical Observations upon the Manchurian Plague Epidemic, 1920-21.**—*Jl. of Hyg.* 1923. May. Vol. 21. No. 3. pp. 289–306. With 2 charts in text. [Refs. in footnotes.]

Zabolotny (D.) **Etudes épidemiologiques. I. L'origine de la peste endémique.**—*Ann. Inst. Pasteur.* 1923. June. Vol. 37. No. 6. pp. 618–626. With 4 plates. [10 refs.]

ENTERIC FEVERS IN THE TROPICS.

PIRIE (J. H. Harvey) & ORENSTEIN (A. J.). **Notes on the Administration of Vaccine per os in an Outbreak of Enteric Fever.**—*Med. Jl. S. Africa.* 1923. Apr. Vol. 18. No. 9. pp. 224–228. With 1 chart. [5 refs.]

Influenced by the arguments of certain recent authorities who regard immunity as fundamentally a tissue-immunity acquired by the cells of the particular tissues susceptible to the particular bacillus, and encouraged by the experience of VAILLANT, who in an epidemic of typhoid in France successfully vaccinated over 1,000 people directly by the mouth with anti-typhoid bile vaccine, the authors, in an epidemic of typhoid at Witwatersrand, tried conclusions with BESREDKA's method of vaccination *per os.*

The epidemic began in November, 1922, in a native mine population of 3,605. Vaccination was not started until the 4th January and was completed on the 12th, about 3,500 being vaccinated and about 100 not. Between the 4th January and the 24th February (since when no more cases have appeared for treatment) 20 cases were admitted, of which 16 had been vaccinated and four not. Of the 16 vaccinated five died, and of the four not vaccinated three died. The 16 vaccinated, however, must have been far gone in the disease when admitted, since their deaths occurred on the 2nd, 4th, 6th, 12th, and 18th days after admission, so that probably they were already in the incubation stage when they were vaccinated. The authors admit the possibility of the epidemic being on the decline when vaccination was commenced, but think that the facts as stated tell in favour of oral anti-typhoid vaccination.

The method of vaccination was as follows: *B. typhosus* (seven strains were used) was grown in trypsinated ox-heart broth for a term of about eight hours and then killed with phenol (one per cent.). The bacilli were removed in a paste by centrifuge, and the paste was diluted with normal saline containing 0·5 per cent. phenol so that a teaspoonful dose should contain the equivalent of 0·015 gm. of dried bacilli—approximately forty thousand million. This dose was given, along with a 3-grain keratin-coated ox-bile pill (B.P.), on three successive days to each man, in about 2,000 cases, and on two successive days in about 1,500 cases.

The advantages of giving anti-typhoid vaccine to natives *per os* are that natives do not object to medicine but very much dislike subcutaneous inoculation, and (in this instance) that not a single case of malaise occurred.

The total number of cases admitted during the outbreak was 53, with 17 deaths. Typical typhoid lesions were found *post mortem* in all the 17 fatal cases, in nine of which a Widal test had been performed with six negative and three positive results.

A. Alcock.

DUBINSKY (I. A.). **Typhusvaccination per os.** [Anti-Typhoid Vaccination by the Mouth.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 68–72. [9 refs.]

The author considers that this method is simpler than the usual method by injection. He gives certain figures in support of his belief and quotes BESREDKA, whose sensitized vaccine was administered.

[It is true that in experiments on animals BESREDKA and BASSECHES thought that some immunity can be established by feeding with living germs, a method not applicable to human beings: v. this *Bulletin*, Vol. 12, pp. 400–401.] Other and later papers by BESREDKA and others on buccal vaccination are given in the bibliography at the end of the article.

J. H. Tull Walsh.

SNIJDERS (E. P.). **Bijdragen tot de kennis van het typhoied-paratyphoied-vraagstuk in de tropen.** [Contributions to the Study of Typhoid and Paratyphoid in the Tropics]. Graduation thesis.—pp. x + 224. With 11 graphs & 25 charts. 1922. Amsterdam: J. H. de Bussy.

An historical survey of the evolution of our knowledge of the prevalence of typhoid and paratyphoid fevers in the tropics, especially in Netherlands India, and in connexion with the writer's personal experiences as bacteriologist to the pathological institute of Medan (Sumatra).

Contrary to European experience in peace-time, paratyphoid A is likewise prevalent, whereas paratyphoid B is of comparatively rare occurrence; very scarce is that form of paratyphoid B assuming more or less completely the character of typhoid (and not of an acute gastroenteritis).

The group of paratyphoid B bacilli requires further study. It contains many heterogeneous elements: only the genuine *B. paratyphosus B*, *B. suipestifer* and *B. enteritidis* (of GÄRTNER) seem to be well defined. All the other members of this chaotic group are very prevalent in human faeces, surface waters, etc., more so than in Europe. Incidentally they might cause diseases resembling typhoid fever, but well-founded observations supporting this view are rare, and they cannot be of use in explaining the etiology of the majority of unclassed fevers.

N. H. Swellengrebel.

SNIJDERS (E. P.). **Typhoid and Paratyphoid Fevers in the Tropics.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 308–333. With 9 charts. [14 refs.]

Historical and statistical, to clarify the view that enteric fever is highly endemic in the tropics. In Sumatra among Javanese and Chinese coolies in seven years the author has met with 1,480 cases of typhoid, 195 cases of paratyphoid A, and 22 cases of paratyphoid B; the death rate was high in comparison with European figures. The author points out that paratyphoid B bacilli are a group with many slightly differing strains or varieties; he has found these in the intestines of a rat and of pigs and even in fish; the strain of the pig was culturally typical, and that of the eel quite typical in all respects.

J. H. T. W.

KHAN (Gopi Pada). **The Use of a Non-Motile Strain of *B. typhosus* in the Agglutination Reaction.**—*Indian Med. Gaz.* Jan. 1923. Vol. 58. No. 1. pp. 18–20.

MISCELLANEOUS.

GAUTIER. **Considérations générales sur la morbidité et la mortalité des Européens et des indigènes au Dahomey, pendant l'année 1921 (Extrait du rapport annuel).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.-Oct.-Nov.-Dec. Vol. 20. No. 3. pp. 347-360.

Malaria in Europeans in Dahomey is on the whole mild ; pernicious forms are seldom seen ; but the anaemia which follows repeated attacks is established more quickly than in other parts of the coast. Blackwater fever is becoming rarer : it is treated with subcutaneous injections of artificial serum (GOUZIEN).* In natives smallpox is one of the most important factors of mortality. Vaccine is prepared at Kandy for North Dahomey, at Abomey for Middle Dahomey and at Porto Novo for Lower Dahomey ; 91,000 vaccinations were done in the year and 35,000 doses of vaccine were sent to Cameroon. No case of yellow fever has been known since 1917, and sleeping sickness is unknown, unless it occurs in Atacora in the north. Dysentery on the coast, and even in middle Dahomey, has increased in frequency of recent years ; and hepatic complications are less rare. There is said to be little bacillary dysentery. The legend that persons bitten by rabid dogs do not contract rabies has lately been refuted by a case in a native girl at Cotonou. Leprosy is not infrequent ; in the Mono district there are 250 cases among 80,000 natives. The natives isolate the leprous in huts in the middle of their fields. The number of cases of tuberculosis—lung, glands and bones—is increasing. Gonorrhoea is common, and syphilis, rare till recently, is spreading with the return of native troops from France or the East. Pneumonia, as elsewhere in African natives, is common. Ascariasis and ankylostomiasis are common enough, and bilharzia eggs have been detected twice in bloody stools. Guinea-worm and filariasis (Bancrofti) are often met with ; *Filaria loa* was extracted from eyes twice. Alcoholism spreads more and more widely : in 1920, 1,210,000 gals. of spirit were imported. In Lower Dahomey, where the bulk of this goes, it is not unusual to see delirium tremens.

A. G. B.

HUOT. **Valeur physique du recrutement indigène dans les colonies du Gabon, du Moyen-Congo, de l'Oubangui-Chari et dans les territoires du Tchad.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.-Oct.-Nov.-Dec. Vol. 20. No. 3. pp. 361-385.

This paper is an account of the relative value for military purposes of natives drawn from many tribes over a wide expanse of tropical Africa. While much is of topical value, it contains points of general interest. The recruits from each tribe are classed as good, passable and bad. Thus, in the Gabon Colony the Pahouins are far in front of the other tribes. Their average height is 1·68 metres, weight 66 kilos and thoracic measurement 0·87 metres, giving an index of 15 by the Pignet formula.* They are active in commerce and in cultivation of the soil, are well nourished and disease among them is rare. In other tribes of the same average height in the same area the weight is 57 kilos, the chest measurement 0·79 metres, and the Pignet formula 26. Their morbidity was high after incorporation, and due chiefly to pulmonary and intestinal infections. The author insists on the distinction between physical deficiency, which yields to good feeding and healthy surroundings, and organic degeneration, which is irremediable. These tribes, even after a longish period, were losing flesh and were clearly quite unsuitable recruits.

---

* GOUZIEN gives hypodermic injections of 200-400 cc. of salt solution, 7-10 per 1,000, once or twice in 24 hours, varying the place and never injecting more than 300 cc. at the same point. Concurrently similar enemata are given. Of 53 cases thus treated at Dahomey all recovered.

In the Middle Congo Colony nine tribes are listed as forming good recruits. Some had a Pignet index of 24 and 25 and formed excellent material; others had an index of 32 and are classed as bad recruits, but it is noted that their morbidity is not high and that they responded well to a liberal diet. The general conclusion for this region is that the races of the north, used to a drier climate, furnished better recruits than those of the south, a forested region where damp heat prevails and poverty is greater. Whereas the races of the north improved under the conditions of military service, those of the south did not.

Two tribes in the Oubangui-Shari Colony are described as poor material; each came originally from a region to the north; their inferiority is ascribed in part to defective diet and habitat due to their labours in the collection of rubber, which oblige them to abandon prosperous villages and live in damp unhealthy valleys. Trypanosome infection is common. Change of climate was not well stood, and led to increased morbidity.

In the Chad Territory many tribes formed good material, but the difficulties are illustrated by the Saras, whose diet has a honey basis, the Toubbous, who will not submit to any discipline, and the Yedenas, cattle-breeding paddlers who inhabit the banks and islands of Lake Chad and, though robust, are developed in the arms at the expense of the legs, and are used to an almost exclusive milk diet. The Chad races are better developed physically than any of the others of the Colonies named, and become better acclimatized in West Africa, Morocco or even France. In the case of all the tribes, even when transferred from the poorest conditions of food and hygiene to a much more favourable régime they lose weight for 2–3 months. Hence the initial training should be carried out as near as possible to the country of origin.

A. G. B.

OUZILLEAU. **L'Afrique équatoriale française.**—*Presse Med.* 1922. Aug. 9. Vol. 30. No. 63. pp. 1313–1322. With 9 text figs.

We have here a graphical sketch of French Equatorial Africa, a country about five times as big as France, stretching from the eternal desert of the Sahara to the eternal jungle-gloom of the equator. The author divides it, like ancient Gaul, *in tres partes*. First, the Saharan wastes, sparsely peopled by bandit Touaregs, who freeze in winter and gasp at 48° C. in summer; next, the tropical region, of which the northern part consists largely of vast undulating savannah peopled by Arabs and their flocks and herds, and the southern part is, at least in the long rainy season, a balmy land of verdure ; and last, the true equatorial region of monotonous tepid moisture and overwhelming suffocating forest.

---

* The Pignet formula = H — (C + W), where H is the height in centimetres, C the chest measurement in centimetres at the greatest expanse, and W the weight in kilos.

The author appeals to medical men, of whom, at present, there are only about 35 in the whole vast tract—35, and 2 specialists at the Branch Institute at Brazzaville. The author draws a fine picture of the tropical doctor and his opportunities ; he must not only love adventure, he must love his work ; he must be a devoted, self-sacrificing person, indifferent to applause ; in his unbounded opportunities for studying nature in all her aspects both benign and morbid he will find his reward.

A. Alcock.

SHATTUCK (George Cheever). **A Preliminary Survey of Tropical Diseases in Massachusetts.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 497–517. With 7 text figs.

The data were obtained from the Massachusetts State Department of Health records for four years for such diseases as are reportable, supplemented by hospital data for the same period, duplication being eliminated by comparing the names of the patients. The following diseases were recorded :—

Name of Disease.	No. of Cases.	Name of Disease.	No. of Cases.
Malaria (reportable) ..	414	Leprosy (reportable) ..	12
Dysentery (reportable) ..	228	Echinococcus cyst.. ..	11
Smallpox (reportable) ..	137	Typhus fever (reportable)	7
Heat-stroke	122	*Bothriocephalus latus* ..	5
Pellagra (reportable) ..	75	Beriberi	5
Uncinariasis (reportable)..	33	Bilharziasis..	5
Elephantiasis	27	Aleppo boil..	3
Actinomycosis (reportable)	12	Blastomycosis	2

Eight other diseases or parasites were recorded once. In most of the malaria cases there was no blood examination ; of the 92 cases in which parasites were found in 78 the infection was benign tertian. Analysis of the place of birth and residence at time of infection makes it probable that 21 cases were contracted near Boston. Of the dysentery cases laboratory confirmation is wanting except in 23 instances in which amoebae were found. The state records show that dysentery is most common in the first decade. Of the 27 cases of elephantiasis one was doubtfully filarial, but the author mentions a case of nocturnal microfilariae in a woman who had never left Boston. The majority of the hookworm cases occurred among the personnel of the Navy and a few from the immigration station. The author says that amoebic dysentery and pellagra are decidedly more common than the numbers indicate, and that all the figures of his list should be regarded as minimal.

A. G. B.

HEGNER (Robert W.). **Porto Rico as a Field for the Study and Investigation of Tropical Hygiene.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 519–529.

The author made a four months' survey of Porto Rico to determine its suitability as a field for the study of tropical hygiene. Owing to overpopulation (350 persons per sq. mile), ignorance, and low wages, the food is deficient both in quality and quantity, and ill-health general. Soil pollution is prevalent everywhere. The diseases of the island are malaria and blackwater fever, hookworm (80 per cent. infestation with high worm count), and other parasitic worms, filariasis, yaws, leprosy, dysentery, bubonic plague, beriberi, pellagra, sprue, dengue, besides mycoses. The infantile mortality is 44·7 per cent. of the total mortality; the chief causes are listed as congenital debility, rickets, tetanus and enteritis. The facilities for study are discussed; they seem to be numerous and good. [One would not expect to find rickets cited as a cause of infantile mortality in a tropical island.]

A. G. B.

CORVETTO (Aníbal). **De algunas enfermedades parasitarias de los Pulmones en el Perú.** [Some Parasitic Diseases of the Lungs in Peru.]—*An. Facul. de Med.* Lima. 1922. Sept.-Oct. Vol. 5. No. 3. pp. 196-204.

The author mentions hydatid of lung, of which he had previously reported 12 cases, and speaks of "hydatid phthisis," a septic condition following rupture of pulmonary hydatid. Paragonimus infection, he states, is more common than is generally believed, and is usually diagnosed as tuberculosis. Lastly, bronchial spirochaetosis receives brief mention, stress being laid upon a form of this accompanied by haemoptysis, and consequently often regarded as tuberculous. It is said to be very infectious.

H. Harold Scott.

TAINAN. **Medical Report of the Tainan Hospital, English Presbyterian Mission, Formosa, 1920-22.** [MAXWELL (James L.).]—pp. 1-26. [For distribution among the Medical Profession only.]

Dr. Maxwell publishes this Report because he believes that the arduous nature of the medical missionary's work is not generally realized—he himself has but one colleague and two voluntary nurses—and because little attention has been paid to the comparative pathology of races. He suggests that the bovine origin of certain forms of tuberculosis would be less discussed if it were realized that all forms are common amongst the Chinese, whose diet precludes possibility of bovine infection.

On the medical side the chief diseases are malaria, dysentery, tuberculosis and ankylostomiasis. Over 2,000 stools are examined yearly and 40 per cent. contain ankylostome eggs. Treatment with carbon tetrachloride is on trial. Syphilis and leprosy are very common. Sodium gynocardate and the ethyl esters of chaulmoogra oil are having a prolonged trial in 120 patients; about 25 per cent. have apparently been cured. Tartarated antimony has failed in lung distomiasis, but has been a real help in granuloma pudendi. Cancrum oris, which is not rare in children after measles, yields to salvarsan products, so that 75 per cent. can be saved. Massive splenomegaly, with cirrhosis of the liver and terminal ascites, is a very common disease in Formosa; its origin is uncertain. In suitable cases, without much ascites, splenectomy has proved a complete cure. Earlier diagnosis is required.

Some details are given of abdominal surgery. In the last year 125 such operations were done. Appendicitis is rare. Of six cases in natives, in some the appendix was probably not primarily affected. The author suspects that the difference in diet between China and the West accounts for the rarity, but notes that appendicitis is becoming more common. Cancer of the stomach is rarely seen, though gastric and duodenal ulcers are not specially rare. Chronic intussusception comes first as an abdominal emergency! Diagnosis from tuberculous peritonitis is difficult. Treatment by ileo-colic anastomosis is satisfactory in all but advanced cases.

Urogenital surgery is common. Rectal stricture, due either to syphilis or gonorrhoea, is relatively frequent and often extreme.

After details of gynaecological and obstetric work come some statistics and a list of operations. The beds number 150. In the 2 years and 10 months the in-patients exceeded 6,000, the out-patients 25,000. There were over 2,000 operations under general anaesthesia. These included :—

Entropion	672	Liver abscess	11
Pterygium	70	Fistula-in-ano	94
Iridectomy..	148	Piles	143
Cataract	94	Tuberculous hip	24
Enucleation	41	Cancer of breast	12
Tuberculous cervical glands	37	Intussusception	18
Inguinal hernia	37	Suprapubic cystotomy ..	34

[Similar reports from other missionary hospitals would be welcome, and perhaps in his next report Dr. Maxwell will give figures from the medical side.]

A G. B.

Marque, Raynaud & Sallet. **Le massif de Bà-Na, station d'altitude pour le Centre-Annam.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 225–228.

Bà-Na, the sanatorium of Central Annam, is situated at an altitude of 1,400 metres (4,590 ft.), some 30 kilometres from the coast town of Tourane, from which it is accessible in part by motor road. The average maximum temperature during the authors' stay was 24·1° C., the average minimum 16·5° ; it is colder than the plains by 10 or 12° C. Fifty-four Europeans who stayed there during the summer of 1920 derived much benefit.

A. G. B.

Mededeelingen van den Burgerlijkgeneeskundigen Dienst in Nederlandsch-Indië. 1922. Pt. 5. pp. 343–473. With 24 charts.—**Annual Report of the Civil Medical Service in the Netherlands East Indies for the Year 1920.**

From this long report, with its many details and tables, a few matters of general interest are noted. There were in this year 80 Government medical officers (presumably European) and 180 " Indian " doctors; the qualified native nurses numbered 165. Many Europeans died from tuberculosis; at Sourabaya one-fifth of the mortality was due to this cause. At Semarang 14·3 per cent. of deaths were due to malaria.

Of 172 Europeans who had sick leave to Europe, in 111 instances the cause was " psychoses and psychoneuroses," dysentery coming next with 13. Inland leave was granted to Europeans in 23 per cent. for psychoses, 18 per cent. for malaria, 6·7 for venereal diseases; to natives, in 20·7 per cent. for malaria, 12·7 eye diseases, 11·5 tuberculosis and 10·9 venereal disease.

Of the deaths in four hospitals, 25 per cent. were for diseases of the respiratory system, 11·9 for tuberculosis, 10·1 for dysentery, malaria coming fifth with 7·8. The Government Vaccine Establishment is very active. Vaccine was sent out sufficient to vaccinate 9,673,000 persons. The total number of vaccinations was 1,157,000; of these 803,000 were controlled and 96·9 per cent. took, "which indeed may be called very good."

At the Pasteur Institute 756 persons bitten by rabid animals were treated.

An estimated 50–60 thousand patients received salvarsan for yaws, usually a single dose of 0·45 gm. The yaws incidence seems to vary much in different parts of the islands.

An epidemic of oedema disease was attributed to the fact that the oil mills often buy the whole coconut crop from the inhabitants, so that there is a shortage of fat.

At the hospital for eye diseases, Bandoeng, of 5,494 patients 2,440 suffered from trachoma.

An interesting account is given of the Government Medical School at Weltevreden. Medical instruction was first given in 1851 by army medical officers in the Malay language, and at first to supply vaccinators; but it was soon found that a more complete training was necessary. In 1875 the course was divided into a preparatory one of two years, and a medical of five, and Dutch was used. In 1881 the preparatory instruction was extended to three years. In 1902 a new establishment, accommodating 200 students was opened, and in 1903 the medical course was extended to six years. In 1913 a second medical school was established and another year added to the medical course. A table shows the subjects studied and the number of hours given to each. The pupils in the year under review numbered 250, of whom 17 were Europeans; 13 obtained the diploma. Many fail to qualify for the medical course, and of those that do many fall by the way.

The Government seeks to co-operate with plantation hospitals, either subsidizing them in exchange for accommodation, or handing over the management of Government hospitals in return for a rent or by joint ownership.

Propagandism is not neglected by this very efficient civil medical service. An adviser for medical propaganda entered upon his duties in the course of this year.

A. G. B.

DE BUEN (Sadí). **Nuevos datos para la distribución geográfica de algunas enfermedades parasitarias en España.** [The Geographical Distribution of Certain Parasitic Diseases in Spain.]—*Libro en honor de D. Santiago Ramón y Cajal.* 1922. Madrid. pp. 407–414. With 2 text figs. [8 refs.]

Accounts are given of a case of relapsing fever in a native of Berrocalejo in the Province of Cáceres, and seven cases of infantile kala azar—two from Villanueva de la Vera, two from Campo de Aranuelo, one from Talavera de la Vieja (all in the Province of Cáceres), and two from the adjacent Province of Toledo. Lastly, is recorded the case of a child of 4½ years from Talayuela (Cáceres) with *Hymenolepis nana*, believed to be the first recorded there.

H. Harold Scott.

LASNET. **Note au sujet de la valeur physique des contingents indigènes de l'armée du Rhin.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 161–175.

The Army of the Rhine for the last two years has included Algerians and Tunisians, Moroccans, Senegalese, Malagasies and Annamites. The average strength of the Algerians and Tunisians was 15,900, and of the Moroccans about 2,000; their sanitary state is good. The Moroccan recruits were superior to the European. The 6,000 Senegalese were withdrawn after six months of these observations. Their sanitary state was satisfactory. The pneumonia rate was only 5·25 per mille, but they had been already acclimatized in the south of France. The hygiene of the 2,000 Malagasies was good in the first year; in the second there was a sensible deterioration, the morbidity having risen from 171 per mille to 1,171; the causes were influenza and other respiratory affections and malaria. They were evidently not yet acclimatized. The 1,150 Annamites were well acclimatized.

Comparative figures are given for the European and the various extra-European contingents, showing the morbidity, mortality and repatriations for the two years both for general reasons and for individual diseases.

A. G. B.

CALCUTTA. **Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases for the Year 1922.**—67 pp. [MEGAW (J. W D.), Director and Professor of Tropical Medicine] [Date and place of publication not stated.]

KNOWLES (R.). **The Calcutta School of Tropical Medicine and Its Programme for Research.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Haflong.* 1923. Jan. 7. pp. 20–51.

From this first annual report of the Calcutta School of Tropical Medicine we learn, to begin with, how much the coming into existence of the school owes to the constancy and the persistent effort of Sir Leonard ROGERS.

The school is now well established, with well-equipped buildings, an adequate hospital, a full staff of whole-time professors and assistants, a good contingent of research scholars, and a competent endowment. What it chiefly lacks is provision for that most fascinating and most promising of all the modern developments of biology, namely, the study of bio-chemistry in its application to tropical disease. A minor defect is that the teaching of helminthology has to be carried on by a professor whose attention is heavily engaged in studies which are not in particularly close interdependence with helminthology.

The reports of the several research scholars deal respectively with kala azar, hookworm, dysentery and other bowel diseases, leprosy, diabetes, and filariasis.

Attempts to discover a laboratory animal unreservedly susceptible to infection with kala azar have not been successful; a transient infection has sometimes been produced, a fact that suggests the necessity of some concurrent infection, or (as with elephantiasis in relation to filariasis) the necessity of repeated reinfection, for the complete establishment of the kala azar parasite. In the experimental treatment of kala azar antimony tartrates have given most satisfactory results, but stibenyl (10 cases) has proved unsatisfactory, besides being dangerous. It has been observed that the slow intravenous injection of therapeutic doses of antimony tartrates does not, like sudden injection of larger doses, cause any remarkable fall of blood-pressure.

In experimental treatment of hookworm carbon tetrachloride, though very potent against the worm, often causes prolonged prostration, and sometimes intractable diarrhoea, when not given concomitantly with a purge (jalap). Chenopodium must be given to children with caution, and is contra-indicated in kala azar, but it can be taken by ordinary coolies without causing interruption of their work. Beta-naphthol acetate has proved most disappointing. Experiments on soil infestation in the open air lead to the conclusion that in Lower Bengal hookworm larvae cannot survive in the soil during the hot weather. In 1921 the reporter (Dr. J. B. McVail) observed that the ordinary septic tank does not destroy hookworm larvae ; he has now devised a tank fitted with baffle-plates and larva-trap which has proved to be nearly perfect against them. Attempts to infect pigs with human ancylostomes have been unsuccessful ; the pig, however, has an ancylostome of its own, the larvae of which perish in water in five days. Observations lead to the suspicion that during the rainy season the vital activity of hookworm in the intestine is increased. Observations on the blood show that concurrent malaria reduces, and concurrent kala azar almost abolishes the high eosinophilia which is characteristic of uncomplicated ankylostomiasis.

Investigation of dysentery has been carried on chiefly in the Bengal coalfields, where the majority of cases were bacillary. Here hookworm complicates the study of bowel diseases.

Experiments in the treatment of leprosy have been conducted with the esters of fatty acids of various non-saturated oils, particularly linseed oil. In the administration of oils the subcutaneous method is often the most effective, by direct effect on the bacillus. Investigation has been made of the lipase content of lepers' blood before and after treatment, to determine whether non-saturated fatty acids increase the lipase in the blood by their influence on the tissues. Attempts to transmit leprosy to monkeys have failed.

Preliminary researches in diabetes have been directed to the determination of normal blood-sugar content and normal urinary sugar of healthy Indians ; their blood-sugar content was found to vary from 0·08 to 0·15 per cent., and their urinary sugar to range between 0·06 and 0·15 per cent. Experiments on rabbits showed that sudden fright caused the blood-sugar content to shoot up to the extent of 50 per cent., and sometimes to nearly double the normal.

The researches of the Pharmacology and the Chemistry Departments have been directed largely towards the analysis of indigenous drugs. From *Lathyrus sativa* a specific substance having an amine base has been isolated, but not an alkaloid. *Boerhaavia diffusa* has been found to yield, besides an unusual amount of free potassium nitrate, an alkaloid having a diuretic effect.

Varied and interesting work has been done in the Pathology Department. Investigation of the action of Shiga bacillus in media rich in amino-acids showed that the bacillus could alter these into bases that had a marked effect on uterine muscle ; cholera vibrio in the same media was capable of forming bases that, when injected into rabbits, caused collapse and diarrhoea. The action of these bases is influenced by the hydrogen-ion concentration of the organs, and varies with the species of animal. Observations in acute amoebic dysentery showed that the stools, unlike those in bacillary dysentery, are acid ; this bears on treatment, since emetine acts (*in vitro*) more powerfully (on infusoria) in a pH 8 than in a pH 7 medium. Experiments with the bases isolated from *Lathyrus sativa* showed that in guinea-pigs they paralyse the hind legs and cause a slight rise of blood-pressure.

In the Protozoology Department much study has been given to kala azar, malaria, and amoebic dysentery. Two cases of dermal infection by *Leishmania donovani* were observed, the lesions being soft granulomata quite unlike Oriental sore; a monkey was inoculated into the skin and the infection " took " locally, after an incubation period of 22 days, but did not become general. Methodical examination of faeces of kala azar patients gave no clue to any imaginable elimination of the parasite by that route, not even in eggs of hookworm or Strongylus; characteristic of the kala azar stools, however, was the abundance of yeasts present (57 per cent. of stools of 210 cases), sometimes in association with " cystic bodies " (probably aberrant yeasts). On the other hand, methodical examination of 442 blood-films from 140 kala azar patients disclosed parasites in 19 per cent. of cases and 12 per cent. of films; and this is held as confirmation of the way of exit by some blood-sucking insect. Much inquiry was also made of the way of entrance of the parasite into man, but not with much success, unless an experiment upon a monkey, which Major KNOWLES lays some stress on, be taken as a finger-post. The monkey was fed upon fresh human spleen full of *L. donovani*, and was then given a drink of 30 cc. of the emulsified spleen; the spleen being kept on ice, this meal was repeated next day; about six months afterwards the creature became very ill, and, being then despatched with chloroform, was found to be massively infected—a "true fulminating kala azar." KNOWLES apologetically suggests as a " wild theory " that man may become infected by eating, dead or alive, the infected insect—or its faeces. [We beseech Major KNOWLES to gird up his loins and repeat this experiment. Did not DARWIN once say that he learnt most from what he called his "fool experiments " ?] In malaria search has been made for some shape or form explanatory of relapses. What has been confirmed in this search is that malaria parasites are destroyed in the spleen (in all cases of malaria with enlarged spleen the organ has been examined by puncture); and what is inferentially suggested by KNOWLES is that it is, so to speak, the business of the spleen to destroy malaria parasites and promote a spontaneous cure, and that if for any reason the spleen becomes obstructed in its work, the parasites get a respite and a relapse occurs. In connexion with amoebic dysentery investigations have been carried on to determine the pH environment of the different intestinal protozoa: with *Entamoeba histolytica* in the active phase (acute stage) the pH of the stools is constantly 6·3; in the inactive precystic and encysting phase the pH of the stools rises to 7·2–8·8; and when the attack is clearing up and Charcot-Leyden crystals appear the stools become very alkaline.

A. A.

DELAMARE (Gabriel). **Essai de classification et nomenclature des maladies exotiques.**—*Ann. de Méd.* 1922. Sept. Vol. 12, No. 3. pp. 245-256.

The author criticizes as illogical the arrangement of diseases in manuals of tropical medicine. The worst offenders are GRALL and CLARAC, and MENSE, but MANSON, and CASTELLANI and CHALMERS are little better. The grouping is not a natural one. STITT is commended for his arrangement—diseases caused by (1) protozoa, (2) bacteria, (3) filterable viruses, and (4) food deficiency and (5) helminthiasis, but he then falls off with (6) granulomata and (7) skin diseases, and the eighth group—diseases of unknown cause or small importance—contains such a heterogeneous collection as typhus, climatic bubo, ainhum, heat stroke, etc.

The author puts forward an etiological classification in tabular form with eight columns, the primary division being into diseases caused by physical agents, chemical agents, and living beings, and diseases of unknown origin. The third group is naturally much the biggest. The physical agent is heat. The chemical agents are poisons and vitamin deficiency. Skin diseases fall into their appropriate groups [an arrangement which has obvious clinical drawbacks]. He goes on to discuss in an interesting way the terminology of disease, which he classifies as anatomical (*e.g.*, ulcerating granuloma of the pudenda, etc.), physiological (*e.g.*, blackwater fever, etc.), clinical, etiological, geographical and historical. He notes that the etiological nomenclature has the disadvantage of depending on the botanists and zoologists. Thus thrush becomes, according to the view of the author, a saccharomycosis, a moniliasis or an oosporosis !

A. G. B.

HEWETSON (W. M.). **Environmental Influences affecting Blondes in Rhodesia and their Bearing on the Future. A Survey of the Situation from the Medical and Scientific Standpoints. Being a Paper delivered before the Rhodesia Scientific Association, at Salisbury, May 15th, 1922.**—27 pp. Salisbury: The Rhodesia Independent Col., Ltd., P.O. Box 592. [Price 2*s*. 6*d*.]

By blondes the author means the Teutonic peoples of Northern Europe—English, Dutch, Germans and Norse. He describes the blonde invasion of the rest of the world, contrasting the slow progress of South Africa with that of the United States of America. If Rhodesia establishes herself as a permanent self-governing community in the Tropics, it will be the first instance of the blondes accomplishing that feat. In 30 years the country has acquired a population of some 34,000, not all blondes ; the birth-rate for the last year was 23·5 per 1,000, compared with 27 in England. The occurrence of blackwater fever is a deterrent to immigration, but " babies are the best immigrants." On the whole, Rhodesians are beyond the natural range of the species.

He goes on to consider climatic conditions—air movements, heat and light, especially the effects ot actinic rays. He suggests that the actinic rays have some intimate relation to the health of the red blood corpuscle, and apparently associates the outbreak of blackwater in the year of the lecture six weeks earlier than usual with the substitution of a dry and sunny for a wet January. He considers that in Rhodesia sun radiation is in excess. He protests vigorously against the corrugated iron which is apparently the usual roofing material in Rhodesia, and contrasts the difference in appearance of children from a thatched house and from an iron-roofed house. " We have carried the iron age too far." Among the remedies suggested for the climatic disabilities of Rhodesia are, the construction of houses to admit of sleeping in the open air, the addition of a storey to the usual type of bungalow " to avoid the midday heat from the earth and for better ventilation," the use of roofing material that is non-heat-conducting, such as asbestos, the cutting of grass round houses instead of its removal, the use of sun spectacles to keep out excess of light and chemical rays ; he regards this as of as much importance as suitable head-gear.

A. G. B.

SUNDSTROEM (E. S.). **Studies on the Adaptation of Albino Mice to an Artificially Produced Tropical Climate. I. Effect of the Various Factors composing a Tropical Climate on Growth and Fertility of Mice. II. Relation of the Body Form and Especially the Surface Area to the Reactions released by and the Resistance to a Tropical Climate. III. Effect of the Tropical Climate on Growth and Pigmentation of Hair and the Dependence of these Integumental Functions on the Temperature Coefficient Law. IV. Effect of Light and Heat on the Resistance of Mice to Acetonitrile. V. Effect of Humid Heat on the Blood Morphology of Mice.**—*Amer. Jl. Physiol.* 1922. Vol. 60. pp. 397–415. With 5 text figs. 416–424. With 2 text figs. 425–433 ; 434–442 and 443–447.

This series of papers is both instructive and suggestive. Such a review as is here possible will merely indicate some of the chief conclusions. The author is convinced that a considerable part of research in the climatological physiology of hot countries may with advantage be done in temperate climates on animals. The results may then be tested by anthropological observations in the Tropics.

i. His main object was to compare the growth of mice that either had been brought into a hot room at an early age—as a rule, at three weeks—or were born in that environment, with the growth of mice that were continously kept at ordinary room temperature ; he studied also the rôle which such factors as light and circulation of air might play in adaptation to a tropical climate. The tropical room had an air capacity of 6½ cu. metres, and was kept at a dry bulb temperature about 10° C. above that of the control room, the average in the hot room in two winter months being 31·8° (89° F.). The wet bulb reading for the same period was 27·9°. The source of light consisted of Mazda globes, two 60-watt lamps in the temperate room and a 100-watt lamp in the hot room. The results showed that the radiation from these, *per se*, was capable of producing physiological effects. About a thousand animals were used, some six to each cage ; they were bred to the fourth generation. The growth studies were continued to the twentieth week.

The results are expressed in tables and curves. Exposure to artificial light at ordinary room temperature accelerated the growth of mice, especially those born in that environment. Confinement in the stagnant hot and humid atmosphere retarded the growth of mice that were transferred to the new environment immediately after separation from their mothers (at three weeks). Succeeding generations of mice born in the hot and humid environment behaved differently ; the first generation may develop normally, the next two may show the greatest effect of the hot climate, at least, as far as growth is concerned. (The fourth generation was not observed beyond the seventh week.) A racial adaptation is suggested.

Exposure to artificial light in humid heat was found to add to the retarding effect on growth. Circulation of the hot and humid air neutralized in part the unfavourable character for growth of the tropical environment. [This is interesting in view of HUNTINGDON's views (see this *Bulletin*, Vol. 17, p. 345).]

The growth of male mice was less retarded by an unfavourable environment and more accelerated by growth-stimulating climatic factors than the growth of females. The author points to the well-known fact that women in the tropics suffer more from the heat than do men. The experience with the mice suggests that this may have a biological significance.

When the fertility of a mouse colony was normal it was not necessarily diminished by confinement in humid heat for four generations.

ii. The author finds that the ears of mice, and also the tail, may serve as auxiliary cooling organs in a hot climate. These parts of the body, as well as the scrotum, in his hot-room mice became greatly hyperaemic. SUMNER has observed that under these conditions the ears and tail may increase in length, thus changing the ratio body surface : weight in a favourable direction. Man, too, may possess some means of increasing his surface : weight ratio. He instances the slender type of the aboriginals in the tropics (height : weight ratio increasing, as does surface : weight ratio), and states that observations in Java on the height and weight of Dutch children show that the height : weight ratio increases considerably faster in Java than in Europe.

In the experiments the batches of mice were kept until two months old in the hot and cool rooms respectively. They were then killed, and weights and measurements were carefully recorded. The conclusions were reached that retardation of growth by enlargement of body surface area may in a tropical climate assist in combating the over-heating of the body, and that animals may by enlargement of peripheral body parts, ears and tail, further improve their cooling mechanisms.

It was shown, moreover, that the mice so modified had acquired an enhanced resistance towards heat, for by accident the temperature of the hot room was allowed to rise to 39° for one night. and of the four survivors out of 23 all were mice, three of them males, which had undergone a retarded growth.

iii. Mice which were suddenly transferred from a hot to a cool environment responded quickly by a stimulated hair growth. Observations made on a man in the tropics suggested that hair growth is most rapid in a cool environment. The hair of recessive albino mice, when exposed to humid heat or to the radiation of strong light, acquired the power of producing pigment. It is suggested that the chemical processes that control the growth and pigmentation of hair may possess different temperature coefficients. The optimum temperature for pigment production appears to fall within the range of tropical heat.

iv. Since a retardation of growth may result from hyperthyroidism, the slow growth in the hot environment might have been caused by the presence in the blood of excessive amounts of the thyroid hormone, that is, by stimulation of thyroid activity. This possibility was tested by Hunt's acetonitrile reaction and was negatived.

It is suggested that tropical climate may—at least for mice—lessen the demand for thyroid hormone in the body.

v. The author is surprised that no attempts have been made to study the effect of humid heat on blood morphology by experiments on animals.

In 10 control mice the average red count was ..	10·14 million
In 16 mice exposed to heat since six weeks old ..	11·16 „
In 8 mice born in the hot environment	12·10 „

" which seems to indicate that a progressive change in a positive direction takes place in the 'descendant' generations." The greater part of this rise is thought to be due to inspissation of blood.

The average white count in the control mice was 7,300; in the heat mice the number for "immigrants" was 6,880, gradually becoming less in the descendants, till in 25 of the fourth generation of heat mice it was 4,950. It is thought that this change is produced by high sensitivity to an increase of temperature of organs concerned in new formation of white blood-cells.

A. G. B.

HILL (Leonard) & CAMPBELL (J. Argyll). **Heating of the Tissues of the Body by Light and Heat Rays.**—*Lancet.* 1923. Apr. 14. pp. 746-749. [9 refs.]

This paper, from the National Institute for Medical Research, Hampstead, is summarized by the authors thus:—

"1. Exposure of the whole body of a rabbit to the sun s rays at Hampstead rapidly increased the temperature of the deeper tissues, the fur temperature rising as high as 54° C.

"2. Exposure of the head and upper part of the body to the sun's rays was followed by a fall of temperature in the deeper tissues, the fur temperature in the sun not exceeding 46·5° C.

"3. Local exposure of the head of a rabbit to the carbon arc greatly increased the temperature under the scalp and in the brain, the fur temperature rising above 60° C. The body temperature—rectum—was often not greatly altered. The respiration was always very rapid—over 100 per minute.

"4. While recognizing fully that heat-stroke is usually due to a general raising of the body temperature, our results show that local heating may occur, and confirm the utility of pith helmets and spinal pads on exposure to tropical sun.

"5. Using the skin of the human knee and ordinary sources of rays—carbon arc and gas radiators—Sonne's results were confirmed—*i.e.*, luminous rays heat up the subcutaneous tissues to a greater degree than do non-luminous rays, the skin temperature being the same in both cases."

The temperatures were taken in some cases by placing delicate thermometers within the tissues, in others by using thermo-electric couples, mounted in hypodermic needles, connected with a differential galvanometer. In most instances the animals were anaesthetized with urethane. It is noted that the rabbit has no sweat glands, but the authors do not seem to think that this disability affects application of the results to man (para. 4 of summary).

A. G. B.

POLIDORI (V.). **Réactions de Gaté-Papacostas et de Hecht-Bauër dans le paludisme, la lèpre et le pian.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1922. Oct. Vol. 1. No. 1. pp. 49-54.

The author in Indo-China tested 614 serums, the majority from syphilis suspects, comparatively by the modified Hecht-Bauer and Gaté-Papacostas or formol-gel methods.

For 415 H.-B. positives there were 334 G.P. + and 81 G.P. — ;
„ 111 „ negatives „ „ 56 „ — and 52 „ + ;

that is, a concordance of 80·5 per cent. in the positive cases and of 53·15 per cent. in the negative.

He thought that the formol-gel reaction might help him in the diagnosis of malaria, leprosy and yaws, and tried it in 5, 8 and 75 cases respectively, but for this purpose it was useless.

A. G. B.

CHATTERJI (Karuna K.). **Further Notes on Margosic Acid and Its Salts and Observations on their Clinical Use.**—*Indian Med. Gaz.* 1918. Oct. Vol. 53. pp. 377–380. With 6 plates & 3 charts. [Received June, 1923.]

Margosic acid is a mixture of the fatty acids of the oil derived from the seeds of the margosa (nîm) tree (*Azadirachta indica*). The sodium and potassium salts are soluble, and the latter is the better. Margosates added to an emulsion of washed human erythrocytes cause haemolysis, and experiments on this property are detailed. Though the margosates are but faintly antibacterial *in vitro*, they are strongly so *in vivo*. In syphilis they are effective in removing tertiary lesions, but less so with primary and secondary manifestations. For scabies, various forms of eczema, and psoriasis they possess curative properties ; they are given both by injection and by local application. In septic cases due to pyogenic microbes they lead to improvement, and in cellulitis, erysipelas, sinuses, etc., the healing properties are remarkable. Short notes are given of 22 cases of primary and secondary syphilis thus treated, 16 of tertiary syphilis, 5 of hereditary syphilis, 14 of skin diseases and 4 of sepsis. Coloured plates illustrate the cure of psoriasis and of ulcers on the scrotum and leg. The cases appear to have received up to nine injections, but no details are given.

A. G. B.

i. KORTEWEG (P. C.). **Klinisch onderzoek over Euphysol chininum.** [Clinical Research on Euphysol chininum.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 13. pp. 1384–1389.

ii. BIJLSMA (U. G.). **Pharmacologisch onderzoek van Euphysol chininum.** [Pharmacological Research on Euphysol chininum.]—*Ibid.* pp. 1390–1397. With 4 charts.

i. In " collobiase de quinine," produced by DAUSSE, Paris, according to the research of KOKS, quinine is kept in a colloidal state in combination with arabinic acid. Korteweg tested the effect of " Euphysol chininum," identical with the collobiase. Administration by the intravenous route of homeopathic doses, as recommended for the collobiase, failed to show any therapeutical effect in cases of sufferers from dementia paralytica artificially inoculated with benign tertian malaria [see this *Bulletin*, Vol. 19, p. 580]. A dose three times as high had no effect either. In administration *per os* the effect of Euphysol chininum corresponded with the amount of basic quinine contained in the new preparation (20 per cent.). Accordingly 2–3 gm. of the powdered drug had to be given to obtain a proper effect. Euphysol chininum, *i.e.*, collobiase de quinine, has no advantages above other salts of quinine.

ii. From the conclusions the following may be mentioned : The toxicity of Euphysol chininum (*i.e.*, collobiase de quinine), as well as its influence on blood pressure, respiration and temperature, and its haemolytic action, is in accordance with the percentage of basic quinine it contains. When injected hypodermically it is more readily absorbed than the hydrochloride, but it causes necrosis. Nothing was found which would justify the expectation of a particularly strong action of this preparation in malaria.

W. J. Bais.

CHOPRA (R. N.). **The Therapeutics of the Cinchona Alkaloids.**—*Indian Med. Gaz.* 1922. Nov. & Dec. Vol. 57. Nos. 11 & 12. pp. 401–406; 441–446. [18 refs.]

An interesting dissertation with, however, a sketchy historical introduction, where the famous Sir CLEMENTS MARKHAM, whose name is perennially rooted in the beginnings of cinchona in India, is disguised as "Sir Robert Markham."

A. A.

ABE (Bungoro), FUKUI (Shinritsu) & IMAI (Idzumi). [**On Acidosis occurring among Stokers working in the Boiler Rooms of H.M.S. Iwate during the Voyage in the Tropics with Special Reference to its Prevention.**]—*Kaigun Gun-I-Kwai Zasshi* (*Bull. Nav. Med. Assoc.*). 1922. July. No. 36. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 329.]

The authors observed that acidosis, developing among the stokers working in the tropics, could be effectively prevented by sodium bicarbonate (1·0–3·0 gm.) in water either before or during work.

J. H. Tull Walsh.

i. DRUMMOND (Jack Cecil) & ZILVA (Sylvester Solomon), with COWARD (Katharine Hope). **The Origin of the Vitamin A in Fish Oils and Fish Liver Oils.**—Reprinted from *Biochemical Jl.* 1922. Vol. 16. No. 4. pp. 518–522. [13 refs.]

ii. —— & ——. **The Preparation of Cod Liver Oil and the Effect of the Processes on the Vitamin Value of the Oils.**—Reprinted from *Jl. Soc. Chemical Industry.* 1922. Aug. 15. Vol. 41. No. 15. pp. 280t–284t. With 1 text fig.

i. The authors trace the origin of the vitamin A in fish oils and fish liver oils to the synthetic powers of the marine algae which form the fundamental food supply of all marine animals. Copepods, larval decapods and molluscs feed on these, and are themselves consumed by small fish, which form the food of the cod, haddock, etc.

ii. A study of the methods of preparation of cod-liver oil showed that the content in Vitamin A did not vary to any great extent with the process. Other fish livers seem to be as valuable as that of the cod, and the stearine, which is usually removed, is a valuable source of vitamin.

A. G. B.

i. SHARPE (W. Salisbury). **The Laryngeal Complications of Tropical Diseases.**—*Jl. Trop. Med. & Hyg.* 1922. Sept. 1. Vol. 25. No. 17. pp. 273–276.

ii. READ (B. E.). **Pharmacognostic Notes. (I) Chinese Materia Medica.**—*China Med. Jl.* 1922. July. Vol. 36. No. 4. pp. 303–305.

iii. LEWIS (J.). **Some Observations on South African Toxicology.**—*S. African Med. Rec.* 1922. Sept. 23. Vol. 20. No. 18. pp. 350–352.

iv. REYNAUD (G.). **Les médecins et les colonies: le crise médicale.**—*Presse Méd.* 1922. Oct. 14. Vol. 30. No. 82. pp. 1713–1715.

i. The "tropical" diseases of this article are leprosy, glanders, enteric fever, hydrophobia, syphilis, tuberculosis, gangosa, anthrax, leukaemia, trichiniasis, erysipelas, mycoses, foot-and-mouth disease. Reference is made also to leeches and intestinal parasites.

ii. The drugs or poisons discussed are ***Illicium anisatum*** and ***religiosum***, *Hydnocarpus anthelmintica*, and ***Datura alba*** and ***stramonium***.

iii. The poisons discussed, among others, are acocantherin, an arrow poison, and also used by the natives as a preventive of infection when eating meat of animals dead of anthrax; the juice of the larva of the beetle Diamphidia, a bushman arrow poison; and the shrubs Plumbago and Melianthus. Some details of extraction of the active principles are given.

iv. The "medical crisis" consists in the scarcity of doctors in the French Colonies, aggravated by the war. The author discusses the how and whence of their recruitment and their training. It seems that the young French doctor prefers a modest competence at home to the chances of an adventurous and responsible career in the tropics.

A. G. B.

i. WATSON-WILLIAMS (P.). **Epididymitis in Malaria and Dysentery.** [Correspondence.]—*Lancet.* 1922. Oct. 28. p. 935.

ii. SMITH (Henry). **Cholera or Dysentery.** [Correspondence.]—*Brit. Med. Jl.* 1922. Nov. 25. p. 1049.

i. A letter in which the writer asks for references to recorded instances of epididymitis due to malaria or dysentery.

ii. The writer asserts that cases he saw in Mesopotamia in 1916 under treatment for cholera were really suffering from bacillary dysentery, and that change of treatment saved lives.

A. G. B.

REVIEWS AND NOTICES.

SANGIORGI (G.). **Protozoi patogeni per l'uomo e per gli animali.**—Reprinted from "Trattato di anatomia patologica per medici e studenti. Pubblicato dal Prof. Pio FOA. Anatomia patologica generale." Part 8–9—pp. 81–149. With text 19 figs. & 2 plates. Unione Tipografico. Turin: Editrice Torinese (Gia Ditta Pomba).

In the narrow compass of 67 pages the author gives a general account of the Protozoa that are pathogenic to man and animals. So far as the more important parasites are concerned the account is in the main good, but elsewhere there is a general tendency to quote, as authentic, statements that are open to serious criticism.

Authorities will hardly agree that *Trypanosoma rhodesiense* is easily cultivated on blood agar, and that the cysts of *Entamoeba histolytica* are rare. The common carrier of canine piroplasmosis, *Rhipicephalus sanguineus*, is omitted. Among the Haemogregarines, which are defined as coccidia parasitic in the blood corpuscles, the various conjectured haemogregarines of man and monkeys are included without reserve, and the figure in plate 2 of an organism there specified as *Leucocytogregarina cuniculi* is probably a vegetable cell. Furthermore, it may be pointed out that *Hepatozoon*, not Leucocytogregarina, is the correct generic name for the mammalian haemogregarines. The author does not mention the coprozoic Protozoa as such, but records as definitely parasitic such coprozoic forms as Bodo, Prowazekia (which is really a synonym of Bodo), Cercomonas, Toxobodo, and Pirobodo. His *Toxobodo intestinalis* is certainly a species of Spiromonas common in old faeces, and his *Pirobodo intestinalis* is probably a coprozoic flagellate of the genus *Heteromita*. His *Waskia intestinalis* should now be known as Embadomonas. The Toxoplasmata receive attention, but of two species mentioned—*T. musculi* and *T. ratti*—it is impossible to tell from the figures what they represent. In the account of Coccidia the human *Isospora* is called *I. bigemina*, and is inaccurately figured; the schizogony stages, which the author claims to have discovered in the urine, are also figured, although there is no proof that the structures in question actually are stages of this parasite. The ciliata are briefly described and the statement is made, without any qualification, that species of Colpoda, Chilodon, and Uronema have been recorded from man.

C. M. Wenyon.

VAN DER WALLE (Nicolaas). **Over de Aanwezigheid van Vitaminen in Urine.** [The Presence of Vitamins in Urine.] M.D. Thesis, Utrecht.—86 pp. With 1 plate & 9 figs. 1922. Amsterdam: M. J. Portielje, Spuistraat 249.

From his experiments on polyneuritic pigeons, which he fed with slightly concentrated human urine, GAGLIO, of Rome, came to the conclusion that urine contains non-specific excretion products possessing a function analogous to FUNK's vitamins. His assistant, CURATOLO, who, using rabbit urine, successfully repeated these experiments, came to the same conclusion and found that urine had even a more powerful effect than the vitamins which FUNK had isolated from yeast.

On the other hand, FUNK had shown before that some purin and pyrinidine derivatives exert a favourable action on polyneuritis. EIJKMAN too has pointed out that temporary curative action on polyneuritis does not warrant the acceptance of the presence of vitamins, and he and VAN HOOGENHUYZE have demonstrated that a mixture of NaCl and KCl favourably influence this disease for a short time. Still more striking is the communication of THEILER, of Pretoria, who got some good results by the injection of ·3 cc. of distilled water. The results of these latter investigations were only very transitory, in great contrast to those of CURATOLO, who states that he had been able to keep pigeons in "the most perfect health " for two months by giving them 5 cc. of rabbit urine per day.

The author of the communication under review has endeavoured to solve the question whether the favourable results obtained by GAGLIO and his co-operators could be explained by (*a*) the presence in the urine of a beneficial mixture of organic and inorganic substances, or (*b*) by the presence, as first suggested by MUCKENFUSS, of vitamins in urine as well as in bile, saliva, etc. A second series of experiments was undertaken to ascertain whether possibly some definitely anti-scorbutic vitamins were excreted with the urine. The details of the experiments should be read in the original paper; suffice it here to mention some of the more important conclusions: (1) Fresh human urine administered in sufficient quantity has a favourable effect on polyneuritis, as has (2) fresh urine which has been desiccated at 37° C. for 16 hours, when administered *per os*, whereas the subcutaneous administration has no effect at all; (3) urine heated at 130° C. for one hour loses its effect; (4) the inorganic salts contained in the urine play a minor part in the therapeutic effect; (5) animal charcoal, which does not itself affect polyneuritis, absorbs the active substances from the urine and renders them ineffective; (6) similar results were obtained with dog's urine as long as the dog was fed on food containing sufficient vitamins, but when the dog was kept on a vitamin-free diet its urine lost its curative properties; (7) as a rule pigeons responded much better to this treatment than fowls; (8) lastly, the author found that urine did not contain any antiscorbutic properties at all.

T. Joekes.

MARTINI (E.). **Lehrbuch der medizinischen Entomologie.** [Textbook of Medical Entomology.]—pp. xvi + 462. With 244 figs. 1923. Jena: Verlag von Gustav Fischer.

In the method of its presentation medical entomology is pre-eminently one of those subjects in which logical formality should be sacrificed to convenience, since in its rational application to medicine—or, rather, to hygiene—what is chiefly required from entomology is, not an academic scheme, but a judicious selection of apposite entomological fact. The author of the present volume, although giving verbal assent to the commonsense view that medical entomology is a subordinate branch of medicine, proceeds to treat the subject with formal precision, in five main sections and a plenitude of subsections, as an independent self-subsistent branch of zoology. Undoubtedly he has collected a great and miscellaneous array of facts, but those of an entomological kind are so much dissipated among extraneous detail, as to disparage their value to the medical man, however much they may interest or instruct the merely curious reader. The first section, of 64 pages, contains an account of the anatomical structure of Arthropoda, exemplified by *Anopheles bifurcatus* in all its phases; also a classification of the phylum, the technical austerity of which is, however, copiously relieved by figures of the different types; this classification takes us, in the case of the orders of medical importance, as far as families. The second section, which deals in 23 pages with venomous Arthropoda, includes some light freight on antitoxins, immunity, anaphylaxis, etc. The third section, of 175 pages, is mostly entomology: it includes the bionomy and taxonomy (as far as genera) of the several orders of "parasitic" Arthropoda, among which are included not only lice, bugs, fleas, ticks, mites, and certain flies, but also all the free-living flies that suck blood, and it also includes methods of destroying the different kinds of parasites. The distinction—so important in its practical bearing—between true parasites, like lice and bed bugs, which, by their necessary dependence on man, are completely at the mercy of the sanitarian's devices, and the merely predatory species, like Anopheles mosquitoes and tsetse-flies, that lead a free life in nature and can be subdued only by fundamental changes in the human social environment, is entirely ignored. The fourth section is entitled "Arthropoda as transmitters of disease" : it contains a lot of miscellaneous entomology (including further instalments of the taxonomy of Culicidae, fleas and ticks) associated with great masses of inspissated helminthology, protozoology, and bacteriology; for the author catalogues his arthropod carriers according to the class of organisms that they foster or transmit, and provides separate sections in which each such class—worms, sporozoa, amoebae, flagellates, spirochaetes, unknown (probably filterable) viruses, and bacteria—forms the subject of a separate treatise. The fifth and final section, of 24 pages, deals with contrivances for the destruction of noxious insects, mechanical means, heat, fumigation and contact poisons almost monopolizing attention.

A. Alcock.

CHOYCE (C. C.) [C.M.G., C.B.E., M.D., F.R.C.S., Director of the Surgical Unit, University College Hospital Medical School, etc.] & BEATTIE (J. Martin) [M.D., C.M., Professor of Bacteriology in the University of Liverpool, etc.] (Pathological Editor). [Edited by.] **A System of Surgery.** Second Edition. In Three Volumes. Vol. I. pp. xxiii + 1013. With 19 colour and 58 half-tone plates & 245 figs. in text. Vol. II. pp. xv + 1057. With 20 colour and 10 half-tone plates & 336 figs. in text. Vol. III. pp. xvi + 1176. With 11 colour and 30 half-tone plates & 329 figs. in text. 1923. London, New York, Toronto and Melbourne: Cassell & Company, Ltd. [Price £6 net per set.]

Mr. Choyce is to be congratulated on the appearance of the second edition of his System of Surgery, the preparation and publication of which have been delayed for some years by war and post-war conditions. In view of all that has happened since the last volume of the first edition was published, it is good to discover few serious gaps in the original list of distinguished contributors. It has been necessary, however, to find new writers for several articles, while all of the remainder, as the editor informs us in his preface, have been thoroughly revised. Material additions have in many cases been made and 150 new illustrations, including 50 plates, inserted. The arrangement adopted in the first edition has been adhered to, surgical pathology and general surgery being dealt with in Volume I and surgical affections of the various regions and organs systematically described in Volumes II and III. Professor J. M. Beattie again collaborates as pathological editor. Military surgery being now regarded as too large a subject for inclusion, gunshot wounds are noticed only with regard to their bearing on civil surgery. Diseases of the eye and most of the cutaneous affections are not dealt with, and for details of operative procedure readers are referred to the standard works on operative surgery.

Consisting as it does of a series of thoroughly up-to-date articles from the pens of selected contributors specially qualified to deal with the various branches of its subject in their rapidly changing aspects, the book is an invaluable one alike from the student's and from the practitioner's point of view. Its reputation has already been established and its utility more than proved.

In the short space at his disposal, it is the intention of the reviewer merely to touch lightly upon points in some of the sections likely to prove of special interest to the tropical practitioner, or the student proposing to adopt a tropical career.

To surgeons in many parts of the tropics and sub-tropics, called upon as they frequently are in out-of-the-way localities to operate without the aid of a skilled anaesthetist, the articles on Local Anaesthesia and Spinal Analgesia should prove of great assistance. The former is by Dr. Gwynne WILLIAMS and Dr. F. S. ROOD, and the latter, a specially valuable contribution, by Mr. Lawrie MCGAVIN and Dr. ROOD. The agents most commonly used and recommended for the induction of spinal analgesia are tropacocain, stovaine, and novocain. Combination with preparations of suprarenal gland is held to be contra-indicated as being probably dangerous to the vitality of the cornual cells of the cord. Applicability and contra-indications are duly considered, advantages and disadvantages weighed, and a full description of the technique of the method given. Post-operative phenomena and possible dangers are detailed.

The contribution by Dr. C. W. DANIELS and Dr. G. C. Low on Yaws, Tropical Sore, Leprosy, Madura Foot, and Granuloma of the Pudenda is an excellent one as far as it goes, but occupies only 17 pages inclusive of illustrations. Considering the great importance of more than one of these subjects, further space might well have been allotted.

The article by Col. J. W. WEST on Tetanus, still sometimes a dangerous factor in tropical surgery, will well repay perusal and study. The advantages of the intra-thecal method of antitoxin administration in declared tetanus are emphasized. In discussing prophylaxis the author refers to the extremely important and perhaps not generally realized fact that antitetanic serum, being only an antitoxin, does not lead to the elimination of the tetanus bacillus from the body, and that, in consequence of the universal prophylaxis resorted to during the war, carriers of the disease have multiplied, and cases of tetanus arisen after operation in the subjects of old war wounds. In such individuals it is very necessary, before operation, to produce immunity by an injection of antitoxin either subcutaneous, intramuscular or intravenous.

Professor F. C. MADDEN, of Cairo, treats of surgical diseases caused by animal parasites, snake bites and scorpion stings, myiasis, and poison wounds inflicted by fish. Most of his space is devoted to Schistosomiasis and Filariasis and their surgical aspects, whilst the lesions produced by the guinea-worms are also described. The student will find in this section ample material for study and assimilation, and this can be supplemented in the case of the more advanced practitioner by reference to standard works quoted in an appended bibliography.

On the subject of Elephantiasis of the Breast Mr. Sampson HANDLEY, in his article on diseases of that organ, mentions recent work by DUFOUGERÉ, FOULERTON and himself, tending to prove that elephantiasis depends upon a chronic infection by the *Staphylococcus pyogenes albus* and recommends that in the earlier stages a vaccine of this organism should be tried with a view to the possibility of arresting the disease. Tropical pathologists will doubtless be interested to hear more with regard to this work.

In an instructive article on the Spleen Sir Charles GORDON-WATSON refers to movable, wandering or ectopic spleen. This is a condition far from uncommon in India, where, when met with, it is usually associated with malarial enlargement. It doubtless occurs as frequently in other malarious countries. He mentions also two cases of splenic abscess reported from South China in which the *Entamoeba histolytica* had been found ; similar cases have been encountered in India and successfully treated by aspiration and emetine.

Mr. Lawrie McGAVIN's article on Hernia is revised by Mr. Choyce. Bassini's operation is the one favoured for radical cure, and the author wisely deprecates the present day custom of discharging patients from hospital 14–21 days after operation as a directly predisposing cause of recurrence.

Writing on Tropical or Amoebic Abscess of the Liver, Mr. G. Grey TURNER, who deals with diseases of that organ and of the pancreas, makes the curious statement that the white races, especially males over 40, furnish 90 per cent. of the cases. No surgeon or physician of tropical experience, whose work has included both white and coloured races, is likely to accept that figure as showing any approximation to accuracy, though it may be taken that the relative liability—obviously a very different matter—of the European soldier in the tropics (incidentally a man considerably under 40 in ordinary times) and the native soldier, man for man, is more than 9 to 1. Mr. Grey TURNER notes that many successful results have been reported from repeated aspirations combined with energetic treatment by emetine. As a matter of fact a single aspiration is very frequently sufficient in this method, the procedure of which is by comparison so safe and simple, and the results so satisfactory, that it is difficult to understand on what grounds the author has formed his opinion that for surgeons with no special experience of this class of case the more formidable open operation is probably the best. Figures furnished by ROGERS, in his Lettsomian lectures of 1922, and by many independent contributors to tropical medical literature, all point in the opposite direction.

In the course of his contribution on the Male Genital Tract, Mr. Russell HOWARD refers to lymph scrotum as the forerunner of elephantiasis, and states that it is hardly necessary to separate the two conditions. Such a view is a mistaken one. Lymph scrotum is the name applied to a lymphangiectasis of the superficial scrotal lymphatics, usually of filarial origin. It is a local condition, but practically always only part of a more generalized lymphatic varicosity. The condition is by no means a necessary stage in the development of scrotal elephantiasis, and only in a proportion of cases does lymph scrotum pass into a state of true elephantiasis.

Many other sections of the work have been read with equal interest and profit. Where the standard is so high there is no room for criticism. The reviewer, like most surgeons whose experience has been acquired in India, has been denied personal practical acquaintance with non-traumatic aneurisms and their treatment and, perhaps for this reason, has derived special pleasure from perusal of the latter part of Mr. Rock CARLING's able and well-informed article on the cardio-vascular system.

The volumes, though substantial, are of convenient size, well printed on paper of the most satisfactory quality and in good legible type. The illustrations are numerous and excellent, many of the colour plates being of exceptional merit. No typographical errors obtrude themselves upon the reader's notice.

J. J. Pratt.

The Practice of Medicine in the Tropics. By many Authorities. Volume 3. Edited by BYAM (W.) [O.B.E.; Lieut.-Colonel, Royal Army Medical Corps (retired); etc.] and ARCHIBALD (R. G.) [D.S.O., M.D. Edin.; Major, Royal Army Medical Corps (retired); Director of the Wellcome Tropical Research Laboratories, Sudan Government, Gordon College, Khartoum; etc.]—xx + 1685–2550 pp. & index. Figs. 581–929; plates 67–96. 1923. London: Oxford Medical Publications. Henry Frowde and Hodder & Stoughton. [Price £4 4*s*.]

Section XIII.—*Disorders of Metabolism* (pp. 1983–2061).

Section XIII deals with the disorders of metabolism and is divided into three chapters on diabetes, the deficiency diseases and pellagra respectively.

In the preface to this work the authors state "our book has been planned to include articles on diseases which are not peculiar to warm countries but which present aspects of importance to practitioners in the tropics." This is evidently their excuse for including Diabetes in this section. A sufficiently detailed account of the disease and its modern treatment is given by Lt.-Col. E. E. WATERS, but it is difficult to see why it was included at all when such admirable monographs and articles are within easy reach of practitioners in the tropics. The only purely tropical features which the reviewer could discover were four in number, viz., ants are attracted by diabetic urine and this may cause the patient to seek advice; starvation in the East is more easily carried out than among Westerns; the rigid Hindu is very difficult to diet because he will eat neither meat, fish nor eggs; the inclusion in the diet tables of certain eastern vegetables. The author of this chapter has accomplished a difficult task with credit, no easy matter when new discoveries are of almost daily occurrence.

Under the heading deficiency diseases are included Scurvy, Beriberi and Epidemic Dropsy. The account of these diseases by Dr. Edward B. VEDDER is most interesting and leaves little room for adverse criticism. Scurvy in particular is described with the touch of a master. The chapter concludes with a summary of our knowledge of vitamins and of their distribution in nature. Support is given to the view that dry beriberi is caused by deficiency of the antineuritic vitamin, while wet beriberi and epidemic dropsy are due to the absence of another vitamin, as yet unnamed.

That Pellagra has not been classified among the food deficiency diseases is scientifically a correct attitude, though there can be but little doubt that at no very distant date the deficiency factor will be proved. The magnificent work of GOLDBERGER in America and WILSON in Egypt goes far in this direction. The theory that the disease is an infection is lightly passed over by Dr. George B. NILES, and SAMBON's simulium hypothesis is not even mentioned. Maize is no longer blamed more than any other carbohydrate as an etiological factor.

It is remarkable that in the section dealing with morbid anatomy great notice is taken of the changes in the sympathetic ganglia (which changes it is admitted have not been proved in all cases nor has it been shown that they do not occur in other diseases), while the well-marked condition known as central neuritis is not mentioned at all. The symptoms can best be explained by the statement that pellagra is a trophoneuresis with skin, alimentary and nervous manifestations. Careful criteria are given by which the disease can be diagnosed and the most important of these discussed as to their relative value in diagnosis. Full directions for treatment are laid down under the headings dietetic, hygienic, medicinal and climatic. The photographic plates illustrating this chapter are particularly good.

A. D. Bigland.

Section XVI.—*Skin Diseases* (pp. 2321-2470).

Sub-Section A.—*Tropical Skin Diseases* [pp. 2321–2452. With 8 plates and 57 figs.] [By CASTELLANI (A.) & CHALMERS (A. J.).]

In determining to make no reference to those skin diseases of cosmopolitan distribution, as encountered in tropical countries, the joint authors of this section have intentionally limited in our opinion the usefulness of their contribution. The subsection on Tropical Dermatomycoses forms naturally a very large portion of the treatise and is described in the masterly manner to be expected of these authorities Their classification of dermatomycoses, based on the anatomical sites of infection, forms a comprehensive schema, while the mycological differentiation is somewhat too detailed for a non-mycologist to appreciate. Worthy of mention is the occurrence of an ectotrichophyton, in addition to the epidermophyton, as the casual parasite of T. cruris. It is to be noted also that the endodermophyton in cases of T. imbricata may affect the nails, while it does not invade the hair follicles. The condition Pinta is fully described, as are also Maduromycosis and Blastomycosis ; the account of this last named infection is of perhaps greatest interest to dermatologists in temperate countries. Among the Dermatobacterioses reference is made to the presence of diphtheroid bacilli in veld sore and the successful treatment of this condition by antidiphtheritic serum. In the lengthy description of Leishmaniasis (cutaneous) there is no mention made of the tuberculoid or lupoid form ; attention is drawn to the occurrence of a vesiculopustular dermatitis following the administration of antimony. The group of tropical dermatoses of unknown causation includes many conditions under a corresponding number of headings. The differential diagnosis contained in the description of several of these dermatoses, unaccompanied by illustrations, is not in some cases very convincing.

Sub-Section B.—*Scabies* [pp. 2452–2470. With 6 figs.] [By MUNRO (J. W.).]

An interesting account is given of the life-history of the acarus. The writer maintains that the cause of the irritation occurring in scabies, as well as the formation of vesicles in the neighbourhood of the burrows, is the secretion of an acrid fluid by the acarus, and is not due to the wandering of the larvae or nymphae on the skin.

W. Jenkins Oliver.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 10.

THE MALARIAS. RECENT STUDIES AND THEIR BEARINGS.

By Lt.-Col. Clayton Lane, M.D. (Lond.), I.M.S. (retd.),
Sectional Editor, Tropical Diseases Bureau.

Since the last general review on the malarias appeared in this *Bulletin* (Vol. 19, p. 93) death has claimed Laveran, who first detected malaria parasites in the blood of man and proved their association with malarial illness, and Manson whose inductive brain led him inevitably from the phenomenon of exflagellation to the hypothesis of an insect host. In his "Memoirs" Ross (1923) has also shown how the inspiration and aid of these men heartened him in the single-handed struggle, pushed to a conclusion in the teeth of necessary and unnecessary difficulties, as the outcome of which he, using indiscriminately *Proteosoma* or *Plasmodium* as occasion demanded, demonstrated the whole of the former's and part of the latter's life-history in *Culex* and *Anopheles* respectively, and, as was said when he received the Nobel Prize, "revealed the mysteries of malaria" to all who were cognizant of his plotted chart. In order to commemorate the twenty-fifth aniversary of this outstanding scientific demonstration it is intended to found in London a Ronald Ross Clinique for Tropical Diseases and Hygiene where laboratory research and clinical investigation shall be combined as far as possible.

Wenyon (1923) has drawn attention to Richard Pfeiffer's deduction, made in 1892, that just as *Coccidium*, sporulating in an epithelial cell, destroys it and developes an oocyst for purposes of migration, so must *Plasmodium*, which sporulates in and destroys the erythrocyte, require an exogenous oocystic phase, completed possibly in certain insects, possibly in part at least in the soil, and conveyed to man through air, water, or, as Koch suggested, through the sting of some bloodsucking insect.

Direct or Parasitic Diagnosis.

The same interval has produced much work on diagnosis, in which matter is bound up the question of latency.

Primary latencies or, as the matter is sometimes alternatively put, incubation periods, of six months and of one year are reported, these periods of residence in England having occurred before symptoms called attention for the first time to the infestation. In certain experimental infections made upon sufferers from general paralysis of the insane this latency has extended for tertian malaria to 31 days, quartan to 50 and subtertian to 14 days.

(11662) Wt P.4/152 1,500 10/23 Harrow G.75 31

Secondary latencies are limited in duration, according to RIEUX (1922) to 12, lengthened later to 15 months. GARIN (1923) doubles this period. The experience of one or two individuals need afford no true indication of the length to which this period may extend.

To meet the cases in which, although infestation is present, it is manifested neither by clinical evidences nor by the detection of parasites in the peripheral blood when the usual thin smear is examined, the use of thick films and of provocative measures continues to be discussed. SEIDELIN (1922*a*) holds that thick films comprise the only means of reaching exactitude in an overworked laboratory. RIEUX, who will not admit the existence of malaria unless he find parasites in the peripheral blood (and presumably holds that he can detect parasites there in all cases in which infestation is present), and whose views on latency are, as noted, correspondingly influenced, prefers the continuous re-examination of thin films.

In the period under consideration no published work has elucidated whether provocative agents throw parasites into the peripheral blood by a mere redistribution, or by inducing vegetative reproduction. Di PACE (1922) as the result of eight years' work is satisfied that the most effective of such agents is the hypodermic injection of 2 to 3 mgm. of nitrate of strychnine. WHITMORE is investigating (1922) the value of violet light as a provocative in *Proteosoma* infection.

Indirect Diagnosis.

In estimating the value of the large mononuclear count in the diagnosis of malaria in the individual, LUCEY's work (1921) is important. The percentage of these leucocytes in finger blood, namely seven in a normal person, does not differ appreciably from that of venous blood; but, again in a normal person, the first drop of blood from the lobe or border of the ear may show a percentage as high as 35 to 41. If a film must be made from ear blood, the first two drops must be wasted.

For the diagnosis of malarial incidence in a community the value of the spleen rate has been rather widely considered. LEGER and BAURY (1922*a*) have found in Senegal no relationship between the parasite and spleen rates, in one village these being 35 and 4 and in another 3 and 27 respectively. The percentage of quartan malaria is very high in these regions.

In Dakar the same investigators (1922*b*) found a spleen rate of 14 and a parasite rate of 50, about half of those who had enlarged spleens not exhibiting parasites in the blood, a condition which they found also in French Guinea, while VAN LAAREN's figure (1922) was one fifth only.

In contrast to these equivocal papers is a group extracted in this *Bulletin*, Vol. 20, p. 551. At the 4th Congress of the Far Eastern Association of Tropical Medicine the value of the splenic index was not even discussed (1921). It was accepted as of unique value, one of the most precious assets of the malariologist; and a Committee of five was appointed to determine, not its quantitative value but the most accurate and usable means of employing it qualitatively, of measuring and recording rapidly and accurately the relative enlargement in each individual, so that the results could be correlated by the thousand.

Another instance of such refinement is that carried out by DARLING (1923) who arranged the school children of a Brazilian village according to the streets from which they came and found in those from the two rows of houses nearest the river a splenic index of 74, from the next 5 rows one of 26, from the next 4 one of 4, while beyond that it was 0.

The index pointed straight to the river bank, and there anopheline breeding-places were found and dealt with.

MAXCY and COOGLE (1923) tested the splenic index in the south-east Missouri lowlands, apparently its first application to the United States, in over two thousand, and the parasite rate in one thousand, school boys. Of those with parasites 50 per cent. had enlarged spleens, of those with enlarged spleens 20 per cent. showed parasites. They concluded that the local splenic index is not only large enough to be a practical factor in revealing the local malarial incidence, but forms a more accurate indication of the general occurrence of malaria than the parasite rate ; while DARLING too questions whether the spleen rate may not be a more accurate measure of the big visceral happenings which accompany malaria than is the parasite rate—when the blood smear is examined by the usual technique.

It has been suggested that in the absence of syphilis, malaria may produce a positive Wassermann reaction. Perhaps the most significant recently reported case bearing on this point is one [MCCONNELL (1923)] in which this reaction was markedly positive, malaria present, and no clinical evidence of syphilis forthcoming. Necropsy revealed syphilitic aortitis.

There emerges from all this the conclusion, old but needing as much emphasis as ever it did. In any particular case the finding of parasites is the only justification for a positive diagnosis of present malarial infection ; but the failure to find them by tne ordinary techniques cannot justify a confident diagnosis that malaria is certainly absent.

The Life-histories of the Malaria Parasites.

(*a*) *The Asexual Cycle.*—Recent events render it advisable to hark back to John D. THOMSON's paper (1917) on certain aspects of malarial relapse. He pointed out that from the examination of a single case followed for 48 hours before relapse occurred, SCHAUDINN held that surviving female gametocytes multiply "parthenogenetically" and produce a brood of merozoits, these starting schizogony. Now parthenogenesis, or reproduction by unfertilized females, would in *Plasmodium* imply that in the mosquito's body an unfertilized female gamete produced a sporocyst. If an unfertilized female gametocyte produce in man's body a bunch of merozoits, this process, whatever it be, is not parthenogenesis, and no analogies can fairly be drawn between this and true parthenogenesis in other animals. The evidence tendered for SCHAUDINN's conclusion was simple. There were found in the same erythrocyte a female gametocyte and a number of spores, no obvious line of demarcation separating the former from the latter, and it was concluded that the spores had been thrown off by the gametocyte. THOMSON's paper then focussed attention on facts, not however observed for the first time, showing that within the same erythrocyte there may be found schizont and schizont, gametocyte and gametocyte, and schizont and gametocyte ; and that in the last two cases the gametocytes may be of either sex. SCHAUDINN's induction implies that in the first two combinations, and in the third also, provided the gametocyte be a male, it is to be concluded that a double infection of the erythrocyte has occurred, just as when a ring accompanies another ring, or one of the other stages. Further, if the outline between a female gametocyte and a sporont be distinguishable they are apparently to be explained as a double infection. If the observer cannot distinguish this outline he must infer that the gametocyte has thrown off the spores.

This curious, devious and arbitrary conclusion has wider biological contacts.

It was acceptance of the principle, established by constant observation, that zoologically related genera have similar steps in their life-histories, which led PFEIFFER, as noted above, to deduce on the analogy of *Coccidium* a sporocystic stage for *Plasmodium*, and MANSON and ROSS to correlate in this respect *Halteridium*, *Proteosoma* and *Plasmodium*. Without assured reliance on this principle ROSS would not have switched to *Proteosoma* when *Plasmodium* material failed, and would not have solved the problem of the transmission of malaria. Since SCHAUDINN's parthenogenesis has not been reasonably suggested as occurring in any related protozoon, his theory is not only a curious and devious explanation of the appearances which he observed, but is not confirmed where its confirmation is rationally to be expected. Moreover, in the period under more immediate consideration KITAEFF and IOFF (1922) report the finding in the one erythrocyte of all combinations, and point out that SCHAUDINN's own plates show no morphological differences between the conditions which he ascribes to double infections and to "parthenogenesis," and that on SCHAUDINN's hypothesis their own observations imply "parthenogenesis" of microgametes.

The exiguous foundation on which these views of SCHAUDINN rest would scarcely justify the space occupied in displaying this point were it not for two recent occurrences.

PONTANO (1923) tenders experimental evidence which, he holds, demonstrates "parthenogenesis," in that injection of blood containing only crescents has induced malaria. The facts are contained in the accompanying Table. The argument runs thus:—

If a thick drop preparation of peripheral blood reveal no rings it is unreasonable to suggest that there are any in 8 to 10 cc. of that person's blood. Experiments 10 and 11 show that blood containing schizonts will produce malaria. Experiments 7 to 9 show that blood in which neither crescents nor rings are found will not carry infection. Experiments 1 to 4 show that if a malarial case whose blood contains crescents and rings be treated until the rings disappear, the blood will still convey malaria; while experiments 5 and 6 show that if treatment be carried further it will not do so. The first two series are, it is held, precisely similar in respect of the treatment given, and, taken with series 3, lead to the conclusion that the schizonts which caused malaria in the recipients can only have been derived from crescents.—

The first two series are, however, not identical. In all cases in which malaria appeared in the recipient treatment had continued for less than nine days after rings had ceased to be found in the films. In all cases in which malaria did not appear treatment had continued for nine days or more after this condition had been reached. This difference is essential. It cannot be disregarded, when one bears in mind the evidence (Vol. 19, p. 98) that treatment produces progressive fractional disinfestation. In other words, the longer the treatment the greater the destruction of parasites and the less likely are any to be present in the 10 cc. of blood injected. This consideration applies to all the cases cited, but with particular cogency to case 2, where one is asked to assume that while it required 74 days of energetic treatment so to reduce rings that they could not be found in a drop of blood, it needed but four more days to carry reduction to the extent that none was present in 10 cc. of blood.

	Duration of malaria in donor.	Duration in days of donor's treatment.	Quantity of quinine & cinchonine taken by donor.	Days of donor's freedom from rings.	Amount of donor's blood injected.	Incubation period in recipient in days.
			SERIES I.			
Blood of donor originally contained rings and crescents, and was treated until the rings but not the crescents had disappeared. It was then injected.						
1	.. 2 years	16	34 gm.	(?)3, (?)4	8 cc.	40
2	.. 4 years	74	188 gm.	4	(?)10 cc.	7
3	.. 7 days	7	16 gm.	8	9 cc.	7
4	.. 18 days	11	24½ gm.	8	10 cc.	7
5	.. 23 days	16	44 gm.	(?)11 (?)12	5 cc.	No malaria induced.
6	.. 27 days	27	71 gm.	(?)21 (?)23	10 cc.	No malaria induced.
			SERIES II.			
Blood of donor originally contained rings only and was not used until these had disappeared under treatment.						
7	.. 1 year	16	32 gm.	13	8 cc.	No malaria induced.
8	.. 1 year	13	21½ gm.	9	10 cc.	No malaria induced.
9	.. 3 days	14	20 gm.	10	10 cc.	No malaria induced.
			SERIES III.			
Blood of donor, who was without treatment, contained rings only when injected.						
10	.. 5 days	Nil	Nil	Nil	8 cc.	(?) 8, (?) 9
11	.. A few days.	Relapse after previous short treatment.	Nil	Nil	10 cc.	15

Note.—PONTANO's figures in table and text are not always identical.

Moreover, SINTON's cultivation experiments (1922*a*) directly prove that parasites may not be found in a thick film and may yet be present in less than 1 cc. of blood.

This experimental evidence of "parthenogenesis" is based then on the assumption that the blood used was free from rings. The assumption is clearly unjustified, the conclusions reached are accordingly untenable; and the evidence produced does not weaken the case against that unnatural suggestion. It remains to add (the second recent occurrence above noted) that the French Commission on Malaria holds definitely, without reasons given, that a certain number of gametes may regenerate by "parthenogenetic" division into schizonts.

The few who believe that there is one mutable species of malaria parasite, essentially of the subtertian form but changing to others with changing seasons, continue the frequent expression of their mutually destructive opinions. They disregard the possibility of double infections as a reasonable explanation of the phenomena on which their arguments rest. The following facts bearing on the matter have recently been published. DOERR and KIRSCHNER (1921) have during 13 consecutive months passed the same strain of *P. vivax* through 62 different persons, covering 240 parasitic generations. The parasite remained throughout *P. vivax*. MUEHLENS and KIRSCHBAUM (1921) during 15 consecutive months transferred *P. vivax* to 59 cases, 20 forming a continuous chain of descent, while quartan parasites were passed to 5 cases 3 in direct descent, and subtertian to 9 with a direct chain of 4. In no case did tertian breed other than tertian, quartan than quartan, subtertian than subtertian. PAISSEAU and LOUBRIEU (1922) point out that autochthonous French cases of malaria should reasonably be single infections and that the only 3 such cases which they have been able to follow up remained as *P. falciparum* irrespective of season. LEGER and BAURY (1922*b*), commenting on a case of quartan malaria in a child of 20 days, note the unseemly haste which, on the unity theory, *Plasmodium falciparum* had here displayed in assuming its quartan disguise. NEVEU-LEMAIRE (1922), in view of the very definite morphological and biological characters of the three species of malaria parasites, finds, like so many others, the revival of the unity theory incomprehensible.

That both the unity and " parthenogenesis " theories run counter to the known anatomy and physiology of protozoa would in itself scarcely justify such full reference to them here, but they would, if true, have very definite practical bearings, clinical and hygienic, and the second has the backing of the French Commission; so that the space now devoted to their consideration seems justified as indicating the meagre foundations on which they stand, clarifying the position and minimizing the need for future references.

Within 100 miles of the place whence came the original specimens of *Plasmodium tenue* Stephens, SINTON (1922*b*) reports these forms in five cases. They appeared during six only of the 48 hours of the life-cycle of forms otherwise conforming morphologically to *P. falciparum*, and occurred particularly at the edges and ends of films. The infections were heavy but symptoms comparatively slight. SINTON points out the resemblance of these *tenue* forms to *P. immaculatum* Grassi and Feletti, 1907, but holds *P. tenue* to be a good species provided that a " tenue " stage be not a part of the life-history of *P. falciparum*. In other words he is unconvinced that the life-history of *P. falciparum*, as at present known in man, is complete. So, too, KNOWLES, ACTON and GUPTA (1923) have unsuccessfully searched by splenic puncture for possible unknown forms which might throw light upon the morphological mechanism of malarial relapse.

STEPHENS (1922) has designated as *P. ovale* forms, not always distinguishable from *P. vivax*, found in an East African case. Their resemblances are noted to *P. vivax minutum* Emin, 1914 (Syn. *P. camarense* Ziemann). It continues to be reported [CATANEI (1922); MARCHOUX (1922); LEGER and BEDIER (1922*a*)] that in certain cases, particularly if fatal, anomalous forms appear. DARLING (1921) gives reasons for believing that the creation of the subspecies *P. falciparum quotidianum* Craig, to account for forms of aestivo-autumnal fever having a quotidian periodicity, is unwarranted, CRAIG's (1921) charts showing evidence of a double tertian infection. BLACKLOCK and ADLER (1922) describe from the chimpanzee a natural malarial infection indistinguishable morphologically from *P. falciparum*. Transmission experiments between man and chimpanzee have hitherto been unsucessful. *P. bouilliezi* Leger 1922 [LEGER (1922)] from *Cercopithecus campbelli* is held to differ from *P. kochi*. BASS (1922) has failed to obtain cultures of *P. falciparum* in sera of *Macacus rhesus*, guinea-pigs and rabbits, indicating the inability of this parasite to infect these animals.

(*b*) *The sexual cycle.*—The suggestion that unknown forms possibly occur in the asexual cycle has been mentioned. Ingram JOHNSON (1922) postulates an unknown form in mosquitoes. Proceeding from his observation that dengue immunizes against malaria he holds it unreasonable to believe that malaria parasites should be "digested" by *Culex* and survive in the closely related *Anopheles*, and suggests that an ultramicroscopic stage in *Culex* produces dengue. The inability of the same species of parasite to live in nearly related host genera is, however, a matter of frequent observation; and it was the observation that the life-history of the mosquito's gregarine was already complete in itself which convinced ROSS (1923) that it represented no phase in the life-history of the malaria parasite, as he at one time thought it might.

The work of WALCH and WALCH-SORGDRAGER (1921) emphasized the fact, most important to the sanitarian, that the Anopheles which is the best local biological host is not necessarily that most concerned in carrying malaria in that particular locality. In this instance the optimum host was *A. ludlowi*, with an infection percentage of 17·5, the least effective biologically being *A. sinensis* with an infection percentage of only 1·5, yet since the latter outnumbered the former by 125 to 1, 107 specimens of *A. sinensis* were infected to every 10 of *A. ludlowi*, so that what one may term the pessimum known local host was the most hygienically important in the dissemination of the malarias. While considering this work it may be mentioned that, on analysis, it contains evidence supporting the findings of WENYON (1921) and of MAYNE (1920) that quinine is much more potent against the schizonts of subtertian and the gametocytes of tertian malaria than *vice versa*; while MUEHLENS and KIRSCHBAUM (*loc. cit.*) show the tolerance of the crescent to quinine in that in winter and in Europe they transmitted subtertian malaria through *A. maculipennis* to a fresh case, the donor, at the time when he infected the mosquito, being under the influence of quinine.

Regarding the life span of mosquitoes and of their parasitizing sporozoits MAYNE (1922) has shown that *A. punctipennis* may live for 231 days, and may harbour living sporozoits for at least 71 days after infection. The average life span of an infected, compared with a non-infected, mosquito was not tested, but since SCHUEFFNER and HYLKEMA (1922) found it comparatively easy to detect early infection in Anophelines, late infection being much rarer, it is reasonably concluded that infestation induced a considerable mortality among them.

So to arrange matters that the individual's own body is not at the moment the most attractive bait to the mosquito is a matter continuing to receive attention. SCHUEFFNER and HYLKEMA (*loc. cit.*) confirm very positively ROUBAUD's observation that certain Anopheles at least prefer animals to man, and that under conditions in which animal houses are so built as to offer to Anopheles the simple comforts of food, shelter and quiet which appeal to them, these houses serve to protect man from their bite and so proportionately from malaria. They estimate that a single buffalo can divert most of the *A. ludlowi* which would otherwise attack 100 persons, buffaloes being more attractive to these insects than are cattle. At the same time starving mosquitoes are broadminded, and will, as the brothers SERGENT note (1921), take enthusiastically to man-eating. Another aspect of this prophylactic self effacement lies in the need, again urged by STEPHENS (1921), of so placing European houses in malarial parts that they are not within easy mosquito flight of those who are infected and careless of their infection—that is to say of hygienically uneducated native inhabitants.

Economic Aspects.

Antagonism between food production and anti-larva measures, the same factors favouring production both of food and of larvae, has been illustrated. The fish ponds of Batavia support an industry of much commercial importance; they also breed quantities of *A. ludlowi*, the essential malarial "vector" of coastal Java. The decision to retain them has resulted in the virtual removal of the town to Weltevreden, some miles inland. In another economic problem, that of rice fields, it is advised that in South Europe [KONSULOFF (1922)] these should be drained dry twice a month, thus twice subjecting to the direct rays of the sun each individual during the period required in these localities for its aquatic development.

Some Local Problems.

Of these the position in Corsica has excited the greatest interest, [SERGENT, Ed. and Et. and others (1921–22)] and seems to carry with it the most widely applicable general lessons. It is an affair of numerous intersecting vicious circles, comprising high freights for coal and manure, deforestation, drying of hill streams, starved and disappearing cattle, lessened cultivation, penury, malaria. The immense drainage works in the coastal plain are hygienically useless. The brothers SERGENT cite the parallel of Algeria, which, 80 to 90 years ago, was almost exactly as Corsica still is. Now it is a mosaic of intensive cultivation with malaria practically absent; the value of intensive cultivation being held to lie mainly in the resulting prosperity, with its corresponding quality of food, clothing, housing and medication. Regarding Corsica, compulsory quininization is advised as the most promising first step in the essential immunizing process of getting rich. Sympathetic and state-aided administration the inhabitants must at first receive, for their vicious circles must primarily be broken for them by outside agency.

EUGLING's work in Albania (1921) demonstrated that adult Anopheles hibernate there within the straws of thatched roofs, as many as sixteen having been found in a single straw; and that larvae in some way manage to survive in the laboratory for months under a layer of ice.

ANGUS's report (1919) on malaria in Palestine during war shows how, provided an antimalarial campaign be pushed with determination and vigour and supported by ample labour, a pestilential region may be occupied by an army without loss of military efficiency. It shows too the essential military value of MANSON-BAHR's Malaria Diagnosis Units.

Treatment.

Only one aspect of treatment is now dealt with, that of quinine administration in tablet form. Others are reserved for future consideration. Considerable heart-burning has followed the racy publication of M. BLANCHARD's experiments (1922) indicating that quinine tablets may be useless owing to their refusing to disintegrate and the consequent failure of the drug to be absorbed, as tested by its excretion in the urine. The French daily press having added with enthusiasm to the consternation so induced, SEIDELIN (1922*b*), LEGER and BEDIER (1922*b*), LANGERON (1922), SERGENT (Et.), FOLEY and CATANEL (1923) (a veritable malarial galaxy) have repeated the experiments with various types of tablet. In all cases quinine excretion, indicative of quinine absorption, was as good as or better than it was in controls who took the drug in solution. A very grave responsibility rests on those who condemn this most convenient and popular form of quinine administration because one brand of tablets was of a fraudulent character.

Clinical Pathology.

Perhaps the most important observation in this matter is that of Benhamou, Jahier and Berthelemy (1921), whose findings are that the urea content of the blood is an important prognostic element in pernicious malarial attacks. If it vary from 0·27 to 0·52 per cent. (or slightly more during fever) the prognosis is good even if there be coma and many parasites—provided quininization be sufficient. If it rise rapidly, or reach 2 per cent., prognosis, even with most energetic treatment by quinine, is grave.

. . . . .

Recent work points then to lines of investigation holding possibilities of fruitful advance ; while local problems in plenty await solution by energetic and well directed application of principles already established.

REFERENCES.*

Angus (1919), xix, 853.
Bass (1922), xix, 587.
Benhamou, Jahier, & Berthelemy (1921), xix, 291.
Blacklock & Adler (1922), xix, 588.
Blanchard (1922), 872 ; xx, 306.
Catanei (1922), xix, 575.
Craig (1921), xviii, 93.
Darling (1921), xix, 288.
—— (1923), xx, 551.
Doerr & Kirschner (1921), xix, 298.
Eugling (1921), xix, 571.
Far Eastern Association of Tropical Medicine, 4th Congress (1921), xx, 551.
Garin (1923), xx, 554.
Johnson, Ingram (1922), xix, 579.
Kitaeff & Ioff (1922), xix, 867.
Knowles, Acton & Gupta (1923). A Note upon Spleen Puncture Findings in Malaria.—*Indian Med. Gaz.*, May, lviii, No 5, 211–213.
Konsuloff (1922), xx, 305.
van Laaren (1922), xx, 293.
Langeron (1922), xx, 306.
Leger (1922), xix, 587.
—— & Baury (1922*a*), xx, 291.
—— & —— (1922*b*), xix, 852.
—— & Bedier (1922*a*), xx, 297.
—— & —— (1922*b*), xx, 306.
Lucey (1921), xix, 290.
McConnell (1923), xx, 564.
Marchoux (1922), xix, 575.
Maxcy & Coogle (1923), xx, 551.
Mayne (1920), xvi, 310.
—— (1922), xix, 868.
Muehlens & Kirschbaum (1921), xx, 295.
Neveu-Lemaire (1922), xix, 855.
Di Pace (1922), xx, 295.
Paisseau & Loubrieu (1922), xix, 576.
Pontano (1923). Sulla riproduzione sperimentale della malaria per mezzo dei gameti —*Policlinico* Sez. Med , June 1, xxx, part 6, 269–287.
Rieux (1922), xx, 294.
Ross (1923). Memoirs : with a Full Account of the Great Malaria Problem and its Solution. (London : John Murray)
Schueffner & Hylkema (1922), xix, 572.
Seidelin (1922*a*), xx, 553.
—— (1922*b*), xx, 306.
Sergent Ed. & Et (1921), xix, 279.
—— & ——, and others (1921–22), xix, 280, 870.
Sergent, Et., Foley, & Catanel (1923), xx, 560.
Sinton (1922*a*), xix, 868.
—— (1922*b*), xix, 862.
Stephens (1921), xix, 285.
—— (1922), xx, 296.
Thomson, J. D. (1917), xi, 1.
Walch & Walch-Sorgdrager (1921), xix, 286
Wenyon (1921), xix, 277.
—— (1923). The Mode of Transmission of Malaria : a Hypothesis advanced by Richard Pfeiffer in 1892.—*Lancet*, July 14, 68.
Whitmore (1922), xx, 302.

---

* References are to summaries in the *Tropical Diseases Bulletin* unless otherwise stated. Dates in parentheses refer to year of publication of original papers.

MEDICAL ZOOLOGY.

HEGNER (Robert W.). **The Prevalence of Intestinal Protozoa and Related Organisms in Porto Rico.** [Correspondence.]—*Jl. Amer. Med. Assoc.* 1921. Oct. 29. Vol. 77. pp. 1439–1440.

The author grasped an opportunity of examining the stools (one specimen; usually 2 hours, never more than 6 hours old) of 83 home-keeping natives of Porto Rico and found organisms in 75 of them, double and triple protozoon infections with admixtures of worms of various species being the rule. The following is the tale of protozoa: *Entamoeba coli* in 30, *E. histolytica* 10, *Endolimax nana* 6, *Iodamoeba bütschlii* 5, *Giardia intestinalis* 8, *Trichomonas hominis* 3, *Chilomastix mesnili* 3. Also *Blastocystis hominis* 36, and *Spirochaeta eugyrata* 1. He quotes figures from the Sanitary Commissioner's annual report showing for Porto Rico an average annual mortality of 24 per mille, 44·71 per cent. of which is infant mortality, of which, again, almost one-third is ascribed to diarrhoea and enteritis; and he considers that the situation in Porto Rico is very favourable for the study of the pathogenetic significance of the intestinal protozoa.

A. Alcock.

FANTHAM (H. B.). **Some Parasitic Protozoa found in South African Fishes and Amphibians.**—*South African Jl. Sci.* 1919. Jan.–Feb. Vol. 15. pp. 337-338.

——. **Some Parasitic Protozoa found in South Africa. II. III. IV. V.**—*Ibid.* 1919. Oct.-Dec. Vol. 16. pp. 185–191; 1920. Nov. Vol. 17. pp. 131–135; 1921. Dec. Vol. 18. Nos. 1 & 2. pp. 164-170; 1922. Dec. Vol. 19. pp. 332–339.

Explaining that the term "parasitic" is intended to cover commensalism and other equivocal or fortuitous animal associations, the author gives here the results of a preliminary survey of protozoon parasites in South Africa. The field of survey includes sea-fishes, mammals, birds, reptiles, amphibia, mollusca and insects, and the tracts investigated include various places besides the digestive tube and the blood. The record is interesting and valuable, but we can here touch only a few points pertinent to this *Bulletin*.

In the course of his work the author, who is one of the original exponents of the view that detects in the herpetomonads of insects the source of leishmaniasis, inoculated the peritoneum of a young white rat with the intestinal contents of a house-fly infected with *Herpetomonas muscae domesticae*, and afterwards examined the rat's blood *daily*—a detail which he insists upon as obligatory. On the 9th day "a few young developing herpetomonads" were found in the rat's blood; on the 25th day an "infection too slight to confirm" by staining, and on the 35th day "a crop of flagellates," which was final. The rat was alive and healthy 315 days after the inoculation. Considering that the animal was a young rat, and that no definite statement is given as to its having been rigidly protected from bad company before and after its inoculation, we are justified in reserving judgment on this rather crude experiment which the author appears to regard as proof of an infection in the rat by the Herpetomonas of the house-fly.

Repeated observations of Sarcocystis are recorded. Fixing attention on the spore phase, the author observed in sheep that in the cold season (June–early August) spores were few; that in spring they began to increase in number, and that in summer (November–May) they became abundant—a seasonal prevalence, as he says.

Balantidium occurs in pigs in South Africa, and the author thinks that in certain circumstances it may be pathogenetic; for not only were red blood cells seen in individual ciliates, but also, on two occasions, minute ulcers were found in the caecum of pigs.

Among the numerous protozoa observed in the horse, a ciliate, *Cycloposthium bipalmatum,* is mentioned as being passed periodically, under conditions of diarrhoea and flatulence, by two horses that suffered from colic. One of these horses passed also a few amoebae very much like *E. histolytica* and ingesting red blood cells.

A. A.

JEPPS (Margaret W.). **Observations on Human Intestinal Protozoa in Malaya.**—*Parasitology.* 1923. June. Vol. 15. No. 2. pp. 213–220. With 1 plate & 14 text figs. [12 refs.]

A careful report on the protozoa discovered in the stools of 1,034 men, mostly Chinese and Tamil coolies, in the dysentery ward of the Kuala Lumpur hospital, nearly all of whom were or recently had been suffering from dysentery. In the majority of cases at least three microscope examinations were made. The following is the tale of species in their percentages: *Entamoeba histolytica,* 14·5; *E. coli,* 7·7; doubtful and degenerate amoebae, 2·5; *Endolimax nana,* 2·2; *Iodamoeba bütschlii,* 0·4; *Giardia intestinalis,* 4·2; *Trichomonas hominis,* 11·5; *Chilomastix mesnili,* 2·5; *Enteromonas hominis,* 3·5; *Embadomonas intestinalis,* 0·1. The rate of infection was for every species higher in Tamils than in Chinese.

A. A.

HAUGHWOUT (Frank G.). [In English and Spanish]. **Significance and Prevalence of Intestinal Animal Parasites in American and European Adults and Children in the Philippines.—Importancia y frecuencia de parasitos intestinales en los adultos y niños americanos y europeos en Filipinas.**—*Jl. Philippine Islands Med. Assoc.* 1923. Mar.–Apr. Vol. 3. No. 2. In English, pp. 72–78. In Spanish, pp. 105–108.

The author has participated in the examination of faeces of about 1,000 American and European adults and children in the Philippines, and has found intestinal parasites in 52 per cent. Among the *adults* 55·3 per cent. had them, *Entamoeba histolytica,* Ascaris, Trichuris, and hookworm being those specified. Among the *children* 28·4 per cent. were parasitized, two instances of *E. histolytica,* 15 of Ascaris, 16 of Trichuris, 8 of hookworm, and an undefined "frequency" of *E. coli* being those specified. Examinations of stools during the past three years show that the prevalent kind of dysentery in Manila is bacillary—in the proportion of 10 to 1.

A. A.

KNOWLES (R.), NAPIER (L. E.) & GUPTA (Biraj M. Das). **A Preliminary Note on the Relationship of the Intestinal Protozoa of Man to the Hydrogen Ion Concentration of their Environment.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. pp. 151–155. [3 refs.]

ACTON has observed that in amoebic dysentery the stools are usually acid to litmus, and in bacillary dysentery alkaline, and that emetine acts better in an alkaline than in an acid medium. Stirred by these facts, and by their own observation that in amoebic dysentery, when the stools are examined daily, a rising pH is usually concurrent with good progress of the patient, the authors undertook the present study of the pH of the "faecal environment" of the intestinal protozoa of man, apparently in the hope of gaining some practical knowledge of circumstances that may influence the activity and pathogeny of *Entamoeba histolytica*. They find that in pure amoebic dysentery, with the stools full of active entamoebae, the pH is usually about 6·22; that in the stage of recovery, when cysts are being passed, the pH is 7·17; and that later still, when Charcot-Leyden crystals hold the field, the pH is 7·36. And from these observations they infer that one of the factors causing *E. histolytica* to encyst may be an increased alkalinity of the pH environment, and also that a sudden alteration to an alkaline pH (as by saline aperients) may kill *E. histolytica* in the active motile stage. Their observations were made on stools examined as soon as they were received from hospital, and by a method of dialysis which they admit to be not quite free from possibility of error. The authors have also experimentally infected with *E. histolytica* a number of kittens, and have tabulated here the results, which show an acid pH of the fresh colon contents in the acute stage of the disease experimentally produced.

A. A.

HENRY (T. A.) & BROWN (H. C.). **The Influence of the Medium on the Toxicity of Certain Alkaloids towards Protozoa.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 61–71. [8 refs.]

Experiments described in this paper show that the toxic effect of both conessine and emetine on protozoa *in vitro*—as also, according to ACTON, of quinine—is considerably increased in an alkaline medium. Quinine base is therefore more toxic than quinine mono-hydrochloride (neutral), and both are more toxic than quinine di-hydrochloride (acid). The probable explanation of the phenomenon is that the alkali has a direct toxic effect on the organisms, though, as experiments here recorded show, this effect is not manifested until that of the alkaloid has been exercised.

In the study of the reactions of protozoa to alkaloids in media of different acid and alkaline concentration certain sources of error are indicated: (1) With infusoria the nature of the particular culture-infusion may affect the susceptibility of the animalcule; the animalcules of a given series of experiments must, therefore, either be grown in a medium of constant composition or be washed before use (which can be done without hurt by repeated slow centrifugation in tap water). (2) In dilutions, ordinary tap water neutralizes acid to a greater extent than distilled water, but tap water that has been boiled for 30 minutes and filtered largely loses this neutralizing power. (3) When alkali and alkaloid are added simultaneously to the protozoa in their medium, the toxic effect is much greater than when the alkaloid is added some time after the alkali, since in the latter case the dilute alkali absorbs CO_2 from the atmosphere and loses some of its alkalinity; this source of error can be obviated by rapidly mixing the culture of protozoa and the reagents together and sealing the mixture in a capillary tube.

As regards the application of their experiments to, say, the treatment of amoebic dysentery, the authors point out that alkalinity cannot be imparted even to the faex simply by swallowing large doses of carbonate of soda, but that faeces are rendered alkaline to a slight extent by the oral ingestion of a combination of sodium carbonate with the heavy carbonate of magnesia and carbonate of bismuth.

A. A.

HEGNER (Robert W.). **The Effects of Changes in Diet on the Incidence, Distribution and Numbers of Certain Intestinal Protozoa of Rats.**—*Amer. Jl. Hyg.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 180–200. With 1 plate & 1 text fig. [3 refs.]

Although the observations recorded in this paper are presented in a severe statistical form, which in the nature of the case must be taken to represent praiseworthy endeavour rather than final attainment of mathematical precision, they are extremely interesting.

Having determined the numerical incidence and the intestinal disposition of certain elements of the intestinal fauna of a large number of rats fed on a " normal " diet consisting mainly of vegetable produce, the author proceeded to investigate the effect upon those elements of the intestinal fauna of diets differing from the " normal."

The specific elements selected for detailed observation were (1) *Giardia muris*, which in 15 rats fed on normal diet was present in all, its optimum disposition being for the duodenum ; (2) *Hexamitus muris*, which was present in 13 of the 15, its optimum but by no means exclusive disposition being for the ileum ; and (3) *Trichomonas muris*, which was abundant in the caecum of all.

In one experiment 15 rats hitherto fed on normal diet were put on a carnivorous diet for 7 or 8 days. On subsequent examination it was found that although the bare fact of specific incidence was not much different, the *numerical* incidence of Giardia, and even more of Trichomonas, was greatly decreased, while that of Hexamitus was considerably increased. Moreover, the optimum disposition of Giardia was changed to the jejunum, while Hexamitus in most cases was restricted to the ileum exclusively.

As a sequel to this experiment, some rats (five) that had been kept on a carnivorous diet for a week were put on " normal " diet with a large addition of dextrin—a substance that is known to have a rapid effect on the intestinal flora. Evidence was obtained that on this diet a considerable lapse of time must occur for the intestine in its several sections to recover its normal density of protozoon population, and that Trichomonas did not multiply until the bacterial flora of the caecum had changed from the putrefactive to the acidophilous type.

In another experiment five rats were fed on a vegetable diet with addition of yeast ; the result was that the average numerical incidence of Hexamitus and Trichomonas was greatly decreased, and that of Giardia was increased with a preponderance in the jejunum.

In another experiment some rats were fed—six for 24 days, two for 31 days—exclusively on whole milk. The results seem to have been extremely unfavourable to all three species of the intestinal protozoa : Hexamitus was found, and then in greatly reduced numbers, in four only ; and Trichomonas, in even greater reduction, in six ; while Giardia, considerably reduced, preponderated in the jejunum.

We agree with the author that these experiments are useful as a guide to further investigation of the influence of changes in diet upon intestinal protozoa, and—it may be added—as an incentive to even wider explorations from the same base.

A. A.

HOGUE (Mary Jane) & VAN WINKLE (Charlotte). **The Effect of Carbon Tetrachloride on Intestinal Protozoa.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 197–202. [5 refs.]

Trichomonas, Embadomonas, and *Spirochaeta eurygyrata* treated with carbon tetrachloride died on the slide straightway, the first two soon disintegrating; but carbon tetrachloride in doses of 1 cc. to kittens infected with Giardia, and in doses of 3 cc. to human beings variously infected with Chilomastix, Trichomonas, Giardia, Iodamoeba, and *Endolimax nana*, had no premanent effect on any of those organisms.

A. A.

MARCHOUX (E.). **Action du stovarsol contre les lamblies.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 325–326. [3 refs.]

A sickly girl of 11 years, who for several years had suffered periodically from diarrhoea that proved to be coincident with passage of Giardia cysts, was treated by the author, for six days, with a daily tabloid of 0·25 gm. of stovarsol (oxyaminophenylarsenic acid); seen 35 days afterwards, the child was better and was passing daily a single formed stool in which Giardia cysts could not by the most careful search be discovered. Another carrier of Giardia cysts was cleared in 10 days by two such quotidian tabloids. Other cases have not ended quite so happily; but the therapeutic value of this remedy in amoebic dysentery is being verified daily.

A. A.

PENTIMALLI (F.). **Flagellati del genere "Tricomonas" nel sangue circolante dell' uomo.**—*Ann. d'Igiene.* 1923. May. Vol. 33. No. 5. pp. 309–315. With 5 figs. [15 refs.]

In this interesting paper, besides a preliminary discussion of conflicting views as to the pathological significance of Trichomonas, there is to be found an account of a case in which a Trichomonas similar to *T. intestinalis* was found in the blood of a hospital patient suffering severely from chronic malaria. In a smear of blood drawn by means of a sterilized pipette and stained with Giemsa many of these flagellates were observed, and four of those that are figured have undoubtedly a close resemblance to ordinary Giemsa-stained specimens of *T. intestinalis.* They were observed on two occasions, at an interval of 10 hours. Some of the patient's blood was injected into the circulation of a rabbit, and some into the peritoneum of a guinea-pig—without any positive results. Owing to several adverse circumstances a satisfactory examination of the patient's faeces could not be made.

A. A.

SHORTT (H. E.). **The Pathogenicity of Insect Flagellates to Vertebrates, with Special Reference to** *Herpetomonas ctenocephali*, **Fantham.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 908–933. With 1 plate. [32 refs.]

The history of this interesting subject is briefly reviewed, to begin with—on the one hand the results of the investigations of WENYON, MACKIE, CHATTON, NÖLLER, and HOARE, who uniformly failed to infect vertebrate animals by injecting insect flagellates into them; on the other hand the uniformly successful operations in this field of LAVERAN and FRANCHINI, FANTHAM and PORTER, and FRANCHINI and MANTOVANI.

The successful operations are then criticized. Attention is directed to the following particulars that require explanation: that although so many animals died after being inoculated with insect flagellates, the individual post mortem investigations did not reveal that large number of parasites which common experience of fatal protozoon infections leads one to expect; that uninucleate forms were so frequently found in the infections attributed to flagellates; that the large number of successful infections (85 per cent. in the cases reported by FANTHAM and PORTER), and so many of them fatal, in animals that largely live on insects, implies a susceptibility remarkably strange in itself and also remarkably difficult to check by "control" observation; that culture methods of distinguishing the specific flagellates were so little used; and that in one of the FRANCHINI and MANTOVANI successful experiments Anaplasma forms resulted from an injection of herpetomonads and when passed on gave rise again to herpetomonads.

A multitude of facts that may give occasion to fallacious inferences in experiments of this kind are then recounted. Flagellates may continue to live, perhaps for several days, and even in adverse circumstances, after removal from their proper insect hosts. Thus HOARE found bug flagellates that had been injected into a vertebrate alive there after four days, and kept ked crithidia alive in normal saline for seven days, and the author kept Herpetomonas taken from a flea alive for six days in a pocket of a Euphorbia. Then many vertebrates are infested with herpetomonads of their own. Artifacts, again, such as distorted platelets and nuclei, may simulate parasites in stained films. Furthermore, in dissecting small animals like mice it is not impossible to damage the gut and so to permit any protozoa that it may contain to escape into fluids and organs from which films are made. Above all, perhaps, the author in the course of his own experiments has observed mice to be infected, not seldom, with a fungus parasite, named by him *Cryptococcus muris*, which may perhaps be the clue to the frequent uninucleate forms of FRANCHINI and FANTHAM.

Finally, the author tabulates with extreme care the results of fifty-four of his own experiments in this field. The insect flagellates that he used were *Herpetomonas ctenocephali* and *H. luciliae*, and the vertebrates into which he introduced them, either in food or by intraperitoneal or intravenous or subdermal or other way of injection, included monkeys, dogs, rabbits, rats, mice, pigeons, and frogs. In no instance did any infection of a vertebrate result. Of the few animals (mainly mice) that died or were killed *in extremis* after being injected, seven were found to be infected with *Cryptococcus muris*.

A. A.

WENYON (C. M.). **Coccidiosis of Cats and Dogs and the Status of the *Isospora* of Man.**—*Ann. Trop. Med. & Parasit.* 1923. July 12. Vol. 17. No. 2. pp. 231-288. With 6 plates & 2 figs. [121 refs.]

This valuable paper contains not only beautifully illustrated descriptions of the Coccidia occurring in cats and dogs, but also a historical review of the literature of the subject and a copious bibliography—so that it is really a monograph and of much wider importance than its title implies. Of particular value is the series of 61 very finely executed figures representing the schizogony, the development of the gametocytes, and the sporogony of *Isospora felis* in great detail. Incidentally the author's studies have led him to the conclusion that the two forms of Isospora oocysts found in human faeces, which have been assumed to be different sized forms of one species, really represent two distinct species: for the smaller of these forms the name *Isospora hominis* is retained, since the author has no doubt of the historic validity of the appellation; while for the larger form the new name *Isospora belli* is proposed.

A. A.

MAZZA (Salvador). **[Frecuencia del *Blastocystis hominis* en las deposiciones de diarreicos cronicos y su tratamiento apropiado.]**—*Prensa Med. Argentina.* Buenos Aires. 1922. Nov. 10. [Summarized in *Bull. Inst. Pasteur.* 1923. July 15. Vol. 21. No. 13. pp. 523–524.]

In the examination of 200 stools from cases of dysentery and chronic diarrhoea the author found *Blastocystis hominis* alone in 50 per cent. and Blastocystis associated with one or more of the following organisms: *Entamoeba histolytica, Giardia intestinalis, Trichomonas intestinalis, Chilomastix mesnili,* Spirillum,—in 40 per cent. more. Thus Blastocystis was absent in only 10 per cent. This fact, coupled with the decrease or recrudescence of the organism according as the patient grew better or worse, convinces the author of the pathogenetic activity of Blastocystis. Blastocystis diarrhoea is characterized by frequent passage of soft or liquid, greenish coloured, acid, and very offensive stools, sometimes concurrent with abdominal pain referred to the region of the caecum or the colon. It is the persistence of Blastocystis unaffected by emetine that explains the relapses in chronic dysentery. The best treatment for Blastocystis diarrhoea is by novarsenobenzol continued for some time: it should be given in capsules or coated tablets of 0·10 gm., 3 or 4 times a day.

A. A.

YAKIMOFF (W. L.). **Sur la question des** *Blastocystis.*—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 326–330. [21 refs.]

Opinions on the nature and significance of Blastocystis are here reviewed, from 1849 to 1917. In 1919 and 1920 the author had to do with "cholero-dysenteric epidemics" in which Blastocystis occurred in the stools, often in association with cholera vibrios, dysentery bacilli, and a variety of protozoa, but much more often by itself alone. In 30 per cent. of 253 cases of Blastocystis *solummodo* the stools were formed, in 33.9 per cent. they were watery, and in the remainder they were variously sanguinolent, or glairy, or rice-water like, or in some way abnormal. The author, therefore, thinks it possible that Blastocystis is not so innocuous as is commonly assumed.

A. A.

i. FRANCHINI (G.). **Essais d'inoculation de latex parasités aux souris blanches. Abcès du foie expérimentaux déterminés par les amibes des latex.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 162–166. With 1 text fig.

ii. ——. **Action des latex végétaux sur différents protozoaires. Culture de trypanosomes dans les latex (2e Note).**—*Ibid.* Apr. 11. Vol. 16. No. 4. pp. 256–263.

iii. LAVERAN (A.) & FRANCHINI (G.). **Expériences sur les flagellés de la punaise du chou.**—*Ibid.* May 9. Vol. 16. No. 5. pp. 319–323. With 2 text figs.

i. An amoebic infection, often slight but sometimes mortal, can be produced in mice by inoculating them with milky juice of Euphorbias (and certain other plants) containing parasites, or with cultures of such plant parasites, or with cultures of tissues of mice that have been infected with such plant parasites. In the case of two mice so infected the author has ultimately observed an abscess of the liver, in the pus of which, or in the neighbouring liver tissue, or in the intestine, amoeba-like parasites with ingested red blood cells in their cytoplasm were not rare. Twenty individual parasites are crudely figured. The blood of the liver in these two cases, when cultivated in Nöller's medium, gave good cultures of the parasites. [The author's terminology lacks uniformity of precision, and it is not always quite clear that the term "parasites" always refers to the latex-amoebae specified in the title.]

ii. The experiments here recorded show [as H. E. SHORTT has already shown in the case of *Herpetomonas ctenocephali*] that trypanosomes of vertebrates can live for some time in the latex of plants—longer than in normal and citrated saline; as also can Lamblia, amoebae, and other intestinal parasites, including bacteria. It is very probable, the author thinks, that certain kinds of sap, even much diluted, may be fit to replace bouillon and other media for culture of bacteria.

iii. A Herpetomonas and a Crithidia are to be found, sometimes in great numbers, in the intestine of a bug—*Pentatoma ornatum*—infesting cabbages in parts of Italy and southern France. These flagellates, injected into the peritoneum of young white mice, can give rise to very slight infections. On one occasion cultivation in N.N.N. medium of heart blood of one such infected mouse produced round or oval organisms, but these did not develop into flagellates nor could they be subcultured.

A. A.

i. SWEZY (Olive). **Mitosis in the Encysted Stages of** *Endamoeba coli* **(Loesch).**—*Univ. California Public. Zool.* 1922. May 20. Vol. 20. No. 13. pp. 313–332. With 3 plates. [16 refs.]

ii. FEIBEL (Bruno). **[Die** *Iodamoeba bütschlii* **beim Schweine und die Bedeutung dieser Infektion des Schweines für den Befall des Menschen mit diesem Parasiten.]**—*Inaug. Diss. Doct. Med. Vet. Berlin.* Hamburg. 1922. 17 pp. [Summarized in *Bull. Inst. Pasteur.* 1923. June 15. Vol. 21. No. 11. pp. 430–431.]

iii. BACH (F. W.). **Zur Kenntnis der bei Affen vorkommenden Entamöben.** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Feb. Vol. 27. No. 1. pp. 31–37. With 14 figs. [5 refs.]

i. *Entamoeba coli* in mitosis is said to possess six chromosomes in distinction from *Councilmania lafleuri*, which has eight.

ii. In 32·8 per cent. of the pigs at the abattoir in Hamburg, most, but not all, of them from 9 to 12 months old, the author found either active forms or cysts of *Iodamoeba bütschlii*. The author remarks on the specific identity of Iodamoeba, Balantidium, Ascarids, and paratyphoid bacillus in man and pig.

iii. A minutely critical account with figures of an amoeba, from a long-domesticated *Macacus rhesus*, finally adjudged to be the *Entamoeba duboscqi* found by MATHIS in a monkey of the same genus. [See this *Bulletin*, Vol. 3. p. 80.]

A. A.

i. LINS (Abdon Eloy Estellita). **Protozoarios e protozooses.**—*Arch. Brasileiros de Med.* 1923. Apr. Vol. 13. No. 4. pp. 381–409. With 4 text figs. [3 refs.]

ii. AMSTER. **Ein neues Züchtungsverfahren für Protozoen.**—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Oct. 24. Vol. 89. No. 1/3. pp. 166–168.

iii. TALIAFERRO (W. H.). **A Study of Size and Variability, throughout the Course of "Pure Line" Infections, with** *Trypanosoma lewisi.*—Reprinted from *Jl. Experim. Zool.* 1923. Feb. Vol. 37. No. 2. pp. 127–168. With 10 text figs. [19 refs.]

iv. LYNCH (Kenneth M.). *Tricercomonas intestinalis* **and** *Enteromonas caviae* **n. sp. and their Growth in Culture.**—*Jl. Parasit.* 1922. Sept. Vol. 9. No. 1. pp. 29–32. With 9 text figs.

v. ZOTTA (G.). **A propos de l'action favorisante du sang sur le développement du** *Leptomonas pyrrhocoris* **dans le bouillon glucosé.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 913–915. [4 refs.]

vi. DESCHIENS (R.). **Variations tinctoriales et morphologiques de** *Giardia intestinalis.*—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 323–325. With 1 text fig.

vii. INAMI (Hamisuke). **[On a New Species of Leukocytozoon found Parasitic in the Cell Nucleus of the Host and on its Development.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1922. Dec. No. 327. [Summarized in *Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. pp. 85–86.]

viii. LEGER (L.) & HESSE (E.). **Coccidies d'oiseaux palustres. Le genre** *Jarrina* **n.g.**—*C.R. Acad. Sci.* 1922. Jan. 3. Vol. 174. No. 1. pp. 74–77. With 9 text figs.

ix. LEGER (André). **Corps de Graham-Smith dans les hématies d'un Primate** (*Macacus rhesus*).—*Bull. Soc. Path. Exot.* 1922. Oct. 11. Vol. 15. No. 8. pp. 679–680. [1 ref.]

x. McDONALD (J. Daley). **On** *Balantidium coli* **(Malmsten) and** *Balantidium suis* **(sp. nov.), with an Account of their Neuro-Motor Apparatus.**—*Univ. California Public. Zool.* 1922. May 8. Vol. 20. No. 10. pp. 243–300. With 2 plates & 15 text figs. [50 refs.]

i. This appears to be the first instalment of a handbook for the study of pathogenetic protozoa in the laboratory.

ii. Discusses peptone solution as a good medium for cultivation of protozoa.

iii. A highly technical biometric paper.

iv. On a n.sp. of Enteromonas from faex of guinea-pig; discusses synonymy of *Tricercomonas intestinalis.*

v. Description of a series of experiments in the cultivation of *Leptomonas pyrrhocoris* in glucose bouillon of pH=7·6 diluted with sheep-blood. In all dilutions from 1 in 5 up to 1 in 5000 sheep-blood promotes the multiplication of the flagellates, but the optima are those between 1 in 50 and 1 in 200. The concurrent influence of H-ion concentration is to be the subject of future consideration.

vi. Certain cysts of Giardia and even certain small active forms, when treated with iodine, take on, instead of the traditional colour, a sky-blue tinge. These blue cysts are observed often to be fractured, and then they generally show bluish-green. The author thinks that these abnormally staining forms, which are concurrent with normally staining forms, are indicative of active multiplication in the small intestine.

vii. A new Leucocytozoon, exhibiting active division in viscera, from *Zosterops japonica.*

viii. *Jarrina* n.g. (so called from oval jar-shaped oocysts) from coot and moorhen.

ix. Describes *Grahamella rhesi* from *M. rhesus*, not visible in unstained blood and not affecting health of host.

x. Besides detailed descriptions and statistical comparisons of the two species the paper includes a list of all the known species of Balantidium and their respective hosts, which latter include Polyps, Medusae, Turbellaria, Annelida, Crustacea, Mollusca, frogs, newts, tortoise, fish, cavy, pig, and man.

A. A.

COWDRY (E. V.). **The Distribution of Rickettsia in the Tissues of Insects and Arachnids.**—*Jl. Experim. Med.* 1923. Apr. 1. Vol. 37. No. 4. pp. 431–456. With 3 plates. [21 refs.]

The author reports that he has examined specimens of 111 species of Arthropods, including spiders, ticks, mites and other arachnids, centipedes, and 13 orders of insects, and has found intracellular, Gram-negative, bacterium-like Rickettsia in 19 of these species, namely, in a spider, 10 species of ticks, 2 species of Trombidiidae, the silver fish-insect (Lepisma), the bed-bug, a chrysopid, 2 species of fleas, and an Ichneumon-fly. He allows that some of the forms included in his definition of Rickettsia ("bacterium-like organisms which are intracellular and Gram-negative") may be bacteria [as his figures strongly and frequently suggest], but he does not agree that they are cognate with Chlamydozoa ; and although he admits the resemblance in shape between granules of blood-derived pigment and certain Rickettsia of insects, he is not inclined to accept the all-sufficiency of WOODCOCK's explanation of the source of Rickettsia.

A. A.

BUXTON (P. A.). **On Predicting the Seasonal Prevalence of an Insect.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 465–468. With 1 fig. [3 refs.]

The author emphasizes the argument, which is not quite so novel as he seems to think, that it is the *concurrence* of the optimum conditions of temperature and moisture in any given locality that advances a particular species there. But since we cannot foresee local atmospheric temperatures and moistures, having at most only meteorological records of the past as an uncertain guide, the recognition of this proposition—as the author undoubtedly realizes—does not imply that the seasonal prevalence of an insect can be predicted with any sort of confidence.

A. A.

ROOT (Francis Metcalf). **Preferential Feeding Experiments with Anopheline Mosquitoes.**—*Amer. Jl. Hyg.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 354–355.

Preliminary experiments on the preferences of *Anopheles quadrimaculatus* were conducted in August and September. In each test several hundred specially bred females were liberated at about 6 p.m. in a mosquito-proof shed divided into six stalls occupied by men and domestic animals. Next morning the mosquitoes that had fed were searched for and collected, and the blood in the stomach identified by the precipitin test. In every experiment where men (in bed with only head and arms exposed) were tested in competition with horses or cows, some mosquitoes fed on men although two or three times as many fed on the domestic animals; considering the greater extent of surface exposed by the animals it is doubtful whether the result indicates any decided preference of *A. quadrimaculatus* for animal blood. In repeated experiments with horses and cows alone, a certain cow was twice as attractive as a horse, while another cow was only half as attractive as the same horse. For more definite conclusions as to preferences of Anopheles mosquitoes, experiments on a larger scale are necessary.

A. A.

i. GRASSI (B.). **Nuovo contributo allo studio dell' anofelismo (paludismo) senza malaria.**—*Rend. R. Accad. Naz. Lincei.* Rome. Classe Sci. fisiche, matemat. e naturali. 1922., Nov. 5. Vol. 31. No. 9. pp. 419–423.

ii. ——. **I cibi preferiti dagli Anofeli.**—*Ibid.* Dec. 3. No. 11. pp. 496–500.

iii. ——. **Ancora sulle preferenze degli anofeli: consequenze epidemiologiche.**—*Ibid.* Dec. 17. No. 12. pp. 535-543.

i. In certain parts of Tuscany where malaria had gradually become extinct, there occurred, probably as a result of infection introduced by returned soldiers, a recrudescence of the benign tertian form of the disease. But, although among the soldiers who reintroduced the infection the disease remained resistant to quinine and relapses were frequent, the local cases were cured with surprising ease—by a few centigrammes of quinine or even by simple purgation. Grassi's explanation is that in malaria-free localities malaria parasites in their passage through Anopheles may undergo attenuation, and he would explain this attenuation by assuming some altered condition in the water in which the Anopheles are bred—possibly a lessened salinity.

[In the light of certain observations made in 1917–18 by S. P. JAMES (this *Bulletin*, Vol. 14, p. 71), one is inclined to question the assumption that this recrudescence of malaria in Tuscany is to be attributed to returned soldiers. JAMES states that "true indigenous malaria in England," as observed by him particularly in the estuary of the Medway, is a mild disease, sometimes so mild as not to interrupt the sufferers' ordinary routine, and rarely relapsing. On the other hand he observed that civilians in a certain part of the same area who became infected through returned soldiers at a military camp, "undoubtedly with the Salonika parasite," were seriously ill and suffered many relapses].

ii. & iii. Grassi disagrees with the view that Anopheles have fixed predilections for any particular species of animal; he thinks that their tastes vary in different localities, and that this variation in food may be one of the factors that influence the epidemiology of malaria. He does not believe in the theory of protection by cattle against malaria; in that part of Padua where malaria is rife the number of cattle is no less than in Verona and other parts of Italy, where malaria is hardly known or quite unknown. Grassi thinks that the waters of Padua contain more salts than those of Verona, and assumes this to be another instance of the virulence of Anopheles being aggravated by the salinity of the water in which they were bred.

A. A.

CRAGG (F. W.). **The Zoophilism of Anopheles in Relation to the Epidemiology of Malaria in India: A Suggestion.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 962–964. [1 ref.]

Accepting ROUBAUD's views upon the efficacy of cattle in affording protection from malaria, the author considers their bearing upon the epidemic malaria that in India has been observed to follow heavy rainfall immediately following periods of deficient rainfall and famine. It has been estimated that in the bad famines of last century more than half the cattle were lost, and the author's suggestion is that this loss of protective cattle must be a very important factor in the causation of an epidemic of malaria subsequent to a famine.

A. A.

LEGENDRE (J.) & LOUIS (J.). **Anophélisme et Paludisme à Beyrouth.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 86–89. [1 ref.]

Without reason, the town of Beirut was supposed to be malarious. During the winter the authors made unremitting search for Anopheles, but could not anywhere find either hibernating adults or hibernating larvae. At the end of March six larvae of *A. bifurcatus* were found in a well, and in the following October, in some pools in the bed of the river, a few larvae of *A. superpictus.* Following this last find, two cases of primary malaria occurred in the garrison. The authors think that the malaria of Beirut must have been Phlebotomus fever.

A. A.

COOLING (L. E.). **Mosquito-Larvivorous Fishes in Relation to Mosquito Reduction Work in Australia.**—*Health.* Melbourne. 1923. Apr. Vol. 1. No. 4. pp. 94–98. [1 ref.]

The crimson-spotted sunfish (*Melanotaenia nigrans*), the green perchlet (*Priopis olivacea*), and the firetail (*Carassiops galii*), are specified as very useful fishes for keeping domestic water-vessels clear of mosquito larvae, since they live happily in captivity. But fish that may devour mosquito larvae in an aquarium need not necessarily be equally destructive under natural conditions, where, among other environmental differences, they have a choice of prey.

Sewage pollution, which in itself is far from unfavourable to larvae of *Culex quinquefasciatus* (= *fatigans*), facilitates the breeding of this species by its fatal effect on its fish-enemies, for although the carp-gudgeon (*Carassiops compressa*) and the trout-gudgeon (*C. mogurnda* var. *adspersa*) can stand a good deal of sewage they do not seem to be much carnivorous.

A. A.

i. CHRISTOPHERS (S. R.). **The Structure and Development of the Female Genital Organs and Hypopygium of the Mosquito.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 698–720. With 2 plates & 3 text figs. [13 refs.]

ii. BALFOUR (Andrew). **Mites on Mosquitoes.**—*Jl. Roy. Army Med. Corps.* 1923. Feb. Vol. 40. No. 2. pp. 122–127. [15 refs.]

iii. LEON (N.). **Ueber die Speichelpumpe der Culiciden.**—*Cent. f. Bakt.* 1. Abt. Orig. 1923. June 28. Vol. 90. No. 5. pp. 361–362. With 1 fig. [4 refs.]

iv. NEVEU-LEMAIRE (M.). **L'évolution de la classification des** *Culicidae.*—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. Apr. Vol. 1. No. 1. pp. 90–107. With 4 text figs. [29 refs.]

v. WILSON (C. E.). **Report of the Entomologist.**—*Rept. Virgin Islands Agric. Expt. Sta., St. Croix, 1921.* Washington, D.C. 1922. Oct. pp. 12–24. [Summarized in *Rev. Applied Entom.* Ser. B. 1923. May. Vol. 11. Part 5. p. 80.]

vi. EDWARDS (F. W.). **Mosquitoes reared by Dr. W. E. Haworth from Coconut Palms in East Africa.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 498–501. With 1 text fig. [1 ref.]

vii. CABALLERO (A.). **Otras especies larvicidas del genero** *Chara.*—*Bol. R. Soc. Espan. Hist. Nat.* Madrid. 1922. Nov. Vol. 22. No. 9. pp. 418–421. [Summarized in *Rev. Applied Entom.* Ser. B. 1923. May. Vol. 11. Part 5. p. 76.]

viii. MACFIE (J. W. S.). **A Note on the Action of Lithium Chloride on Mosquito Larvae.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 9–11.

ix. CONNOR (M. E.) & MONROE (W. M.). [**Notes sur la durée de la vie des larves d'***Aëdes calopus* (*Stegomyia*) **privées de l'oxygène de l'air et vivant dans de l'eau alcaline.**]—8 pp. 1922. Mexico: Edited by Departamento de Salubridad Publica. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1923. Apr. Vol. 15. No. 4. p. 505.]

x. MACFIE (J. W. S.). **Depth, and the Larvae and Pupae of** *Stegomyia fasciata,* **F.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 5–8. [1 ref.]

xi. CONNOR (M. E.). [**Renseignements sur l'***Aëdes calopus* (*Stegomyia*).]—8 pp. 1922. Mexico: Edited by Departamento de Salubridad Publica. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1923. Apr. Vol. 15. No. 4. p. 506.]

i. A very clear description, with some excellent figures.

ii. A useful summary, with references to original publications on the subject.

iii. Remarks on the absence of a salivary pump in Corethra, and on its larger size in the female (especially old females) than in the male of Culicines and Anophelines.

iv. A historical review of the subject, leading up to the author's own ingenious classification into five subfamilies: Anopheline, Sabethine, Megarhine, Uranotaeniine and Culicine—the Corethrines being excluded as a separate family.

v. The mosquitoes of St. Croix are *Culex fatigans, Stegomyia fasciata,* and *Anopheles albimanus.*

vi. A list of 17 species of mosquitoes breeding "in considerable numbers" in water collecting in the tops of coconut palms: it includes *Anopheles costalis* and *pretoriensis, Stegomyia fasciata,* and *Culex fatigans.*

vii. Besides *Chara foetida, C. gracilis* and *C. intermedia* are toxic for mosquito larvae. Even the water in which these plants have been grown may be toxic.

viii. Lithium chloride even in very weak solutions is very hurtful to larvae of *Stegomyia fasciata, Culex fatigans, Anopheles costalis,* and even of *Mansonia africana.*

ix. Petroleum being directly toxic to larvae, inspectors at Tampico were instructed to inform the population that it was not necessary to leave it in their washing-water longer than ten minutes.

x. It has been thought that larvae of *Stegomyia fasciata* are incommoded by depths of more than three feet: this paper records evidence that the pressure of even seven feet of water has no injurious effect upon them.

xi. A summary of existing knowledge of the subject.

A. A.

i. DE BUEN (Sadi). **Algunas observaciones sobre la biología del** *Anopheles claviger* **F. en Talayuela (Cáceres).**—Reprinted from *Bol. de la Real Soc. Española de Historia Natural.* 1922. June. Vol. 22. pp. 284–294.

ii. LARDE Y ARTHES (Carlos Roberto). **Anofeles de el Salvador y profilaxia palúdica.**—*An. del Depart. Nac. Hig.* Buenos Aires. 1922. Jan. & Feb.; May & June; Sept., Oct., Nov., & Dec. Vol. 28. Nos. 1, 3, & 5 & 6. pp. 17–35; 179–195. With 8 figs., & 321–340. With 3 figs.

iii. BARNES (M. E.). **Notes on the Anopheline Mosquitoes of Siam.**—*Amer. Jl. Hyg.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 121–126.

iv. MARTINI (E.). **Die Stechmücken und die Trockenheit des letzten Jahres (1921).**—*Zeitschr. angew. Ent.* Berlin. 1923. Jan. Vol. 9. No. 1. pp. 121–132. With 2 figs. [Summarized in *Rev. Applied Entom.* Ser. B. 1923. May. Vol. 11. Part 5. pp. 73–74.]

v. MACFIE (J. W. S.). **A Note on a Beetle which preys on Mosquito Larvae.**—*Bull. Entom. Res.* 1923. Apr. Vol. 13. Pt. 4. p. 403.

vi. CHRISTOPHERS (S. R.). **An Anopheles of the** *Myzorhynchus* **Group** (*Anopheles amazonicus* **sp. n.**) **from South America.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 71–78. With 1 plate. [1 ref.]

vii. EVANS (A. M.). **Notes on Culicidae in Venezuela, with Descriptions of New Species. Part III.**—*Ibid.* pp. 101–111. With 5 text figs. [6 refs.]

viii. CHRISTOPHERS (S. R.). **A New East-African Anopheline** (*A. kingi*) **related to** *A. natalensis*, **Hill and Haydon, and** *A. watsonii*, **Leicester.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1008–1019. With 2 plates. [5 refs.]

ix. NEIVA (Arthur) & PINTO (Cesar). **Sobre uma nova anophelina brazileira** (*Cellia cuyabensis* **nov. sp.**).—*Brazil Medico.* 1923. Apr. 28 Year 37. Vol. 1. No. 17. pp. 235–236. With 3 text figs.

i. This is one of a series of papers on the biology of *Anopheles maculipennis*, which is being studied locally in the province of Cáceres as part of an antimalarial campaign. It describes in much detail observations on the hibernation of the insect.

ii. A useful compilation. The four local spp., *tarsimaculatus*, *pseudopunctipennis*, *strigimaculatus* and *apicimaculatus* are described in detail in all their phases.

iii. Eighteen species mentioned, all well-known Oriental forms.

iv. An interesting item of this discursive article is the statement that eggs of *Anopheles bifurcatus* kept on damp (not wet) earth for six weeks in an air temperature of 19°–22° C. can hatch afterwards.

v. The beetle is *Cicindela octoguttata*, a tiger beetle said to be a common tropical African species. These beetles are often seen in rows at the edge of pools and puddles, standing alert just in the water. The author has watched them for hours preying on larvae of *Anopheles costalis*.

vi. One very remarkable feature of this species is the length of the anterior fork-cell, which is one-third that of the wing.

vii. The "new species," *Anopheles venezuelae* [this *Bulletin*, Vol. 19, p. 828], is here formally consigned to Lethe as a synonym of *A. punctimacula* of DYAR & KNAB.

viii. *Anopheles kingi* is a large Myzorhynchus-like insect with *sinensis*-like wings, easily identified by having all four segments of the palpi tipped with white, the femora and tibiae conspicuously spotted and by the hind tarsi being entirely dark as to the last segment and creamy white as to the fourth and the distal portion of the third segments.

ix. Nearly related to " *Cellia* " *rondoni* of these authors.

A. A.

JOHNSON (W. B.) & LLOYD (Llewellyn). **First Report of the Tsetse-Fly Investigation in the Northern Provinces of Nigeria.**—*Bull. Entom. Res.* 1923. Apr. Vol. 13. Pt. 4. pp. 373–396. With 5 plates & 1 map. [4 refs.]

In the Northern Provinces of Nigeria the prevalent tsetse-flies—to which this report is restricted—are *G. palpalis, G. tachinoides*, and *G. morsitans*. The local distribution, breeding habits, hosts and host-relations, susceptibility to trypanosome infection, and general economic and pathonomic importance of these three species are here seen to have been most carefully and skilfully analysed and compared.

G. palpalis is dependent on forest that is mainly evergreen; for *G. tachinoides* a combination of evergreen and deciduous trees is sufficient; but tangled, impenetrable forest is interdictive to both species. *G. morsitans* requires a certain amount of shade, and is restricted to "game" tracts; but *palpalis* and *tachinoides* get a considerable part of their nourishment from animals (probably crocodile and Varanus) other than mammals, and *tachinoides* can thrive where man is almost the only host.

Of the three species, as here investigated, *G. tachinoides* is the most dangerous, as well as the most hurtful economically; since, being a carrier of human trypanosomiasis in the north-eastern and eastern districts and being also a carrier of the trypanosomiasis of domestic animals, it comes more in touch both with men and cattle than its two congeners. It, therefore, more than any other of the locally-prevalent species, hinders that increase of population and that expansion of farming which are the most certain checks upon the tsetse-fly.

For this and other good reasons, the breeding habits of *G. tachinoides* are described in some detail. The typical breeding-places are patches of sand in openings of the forest, or dry beds of streams, shaded by high trees but not by low bushes—a distinction from *G. palpalis*. The rate of breeding is restrained in the wet season, perhaps because in the dense, luxuriant undergrowth, food at that season is hard to find and nutrition suffers. There is no striking disproportion in the sexes in collections of *tachinoides* caught by the net.

We have here noticed merely the more pertinent conclusions of a right piece of work—a clear, concise, well-digested report of a comprehensive, perspicacious, well-conducted survey—which should be consulted in the original, both for its matter and for its scientific method.

A A.

CARPENTER (G. D. Hale). **Report on a Test of a Method of attacking** *Glossina* **by Artificial Breeding Places.**—*Bull. Entom. Res.* 1923. Apr. Vol. 13. Pt. 4. pp. 443–445.

The author, throwing all his manifold local and general experience into the business, constructed decoy breeding-places for *Glossina palpalis* in two islands of Lake Victoria that were well known to him [see this *Bulletin*, Vol. 16, p. 107]. Though the decoy breeding-shelters turned out to be much more popular with the flies than neighbouring natural breeding-places selected for comparison, the author reluctantly concludes that his hopes of destroying tsetse-flies by this single measure have not been justified ; at the end of nearly a year there is no appreciable lessening in the number of pupae deposited. He still thinks, however, that in combination with other measures this procedure would be useful in reducing the numbers of the fly.

A. A.

i. EDWARDS (F. W.). **New and Old Observations on Ceratopogonine Midges attacking other Insects.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 19–29. With 1 text fig. [19 refs.]

ii. O'GORMAN (C. J.). **Sand-Flies.**—*Jl. Roy. Army Med. Corps.* 1923. July. Vol. 41. No. 1. pp. 47–48.

iii. LARROUSSE (F.). **Nouvelle espèce Américaine du genre** *Phlebotomus P. Tejeraae*, **et tableau permettant de déterminer les males des différentes espèces de ce genre.**—*Bull. Soc. Zool. de France.* 1922. Vol. 47. pp. 41–46. [1 ref.]

iv. NEVEU-LEMAIRE. **Les phlébotomes en pathologie humaine.**—*Rev. prat. Malad. des Pays Chauds.* Paris. 1922. Oct. Vol. 1. No. 1. pp. 25–33. With 1 text fig.

v. ATKINS (W. R. G.). **Note on the Chemotropism of the House Fly.**—*Ann. Applied Biol.* 1921. Nov. Vol. 8. No. 3–4. pp. 216–217.

vi. FERRIS (G. F.). **Observations on the Larvae of some Diptera Pupipara, with Description of a New Species of Hippoboscidae.**—*Parasitology.* 1923. Mar. 22. Vol. 15. No. 1. pp. 54–58. With 4 text figs.

i. Annexed to these interesting observations is a list of references to original papers.

ii. The author states that as a result of two years' study of the habits of "Sandflies" at Peshawar he is persuaded that they do not pass through a 16-mesh mosquito net.

iii. A key to the males of the species of Phlebotomus.

iv. This is an instructional paper briefly describing Phlebotomus (with a good figure of *P. papatasii*), and the diseases which it is instrumental in transmitting.

v. This confirms the efficacy of dilute formalin and of beer as fly-traps. The attractive effect of aeroplane "dope" and even more of nitro-cellulose varnish upon flies is also noticed.

vi. An interesting paper in which are described the larvae of a Streblid (*Aspidoptera megastigma*), of *Nycteribia pedicularia*, and *Ornithomyia strigilecula.*

A. A.

TICHO (A.). **Ophthalmomyiasis.**—*Brit. Jl. Ophthalm.* 1923. Apr. Vol. 7. No. 4. pp. 177–182. [7 refs.]

Six cases of "external" ophthalmomyiasis (*i.e.*, myiasis of the coverings and adjuncts of the eyeball), have been observed by the author in ten years ; in all, the patient's account was that something had struck the eye and caused pain, the result generally was conjunctivitis and swelling of the eyelids, and the diagnosis was made by observation of the living maggots. Brief abstracts of most of the cases are given ; in three of them the larva or larvae were identified, and were, severally, "Oestrus-like," *Oestrus ovis*, and *Rhinoestrus purpureus.*

A. A.

WRIGHT (R. E.). **A Further Note on Myiasis of the Frontal Sinus.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 259–260. With 1 fig.

Case of a child of one year admitted to the Madras Ophthalmic Hospital with a suppurating sinus over the left eyebrow. On the left side the forehead and nose were extensively inflamed, the eyelids swollen and closed, and the skin all round the orbit was excoriated, the eyeball, however, was unaffected. The sinus showed a punched-out edge and led into a bony cavity in which live maggots were seen, these being identified as *Chrysomyia bezziana*. The maggots were removed by irrigation, the sinus was drained, and the child was discharged, apparently well, ten days afterwards. A. A.

i. GROS (J.) & MORENO (R.). **[Tres casos de miasis nasal.]**—*Bol. Med. Quirurgico.* Habana. 1922. May. Vol. 2. No. 5. p. 3. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Feb. Vol. 27. No. 1. p. 39.]

ii. PEDRO (Antonio). **Novo tratamento das myases.**—*Brazil-Medico.* 1923. Apr. 7. Year 37. Vol. 1. No. 14. p. 190.

iii. FLETCHER (T. B.). **Report of the Imperial Entomologist.**—*Sci. Repts. Agric. Res. Inst. Pusa. 1921–1922.* pp. 51–67. With 3 plates. Calcutta. 1922. [Summarized in *Rev. Applied Entom.* Ser. B. 1923. Mar. Vol. 11. Pt. 3. p. 35.]

iv. PERYASSU (A.). **[Os Mosquitos Portadores de Ovos da Mosca do "Berne." (Nota Previa).** [Mosquito Transporters of the Eggs of *Dermatobia hominis*. Preliminary Note.]—*A Folha Medica.* Rio de Janeiro. 1922. July 15. Vol. 3. No. 14. p. 105. With 1 text fig. [Summarized in *Rev. Applied Entom.* Ser. B. 1922. Nov. Vol. 10. Pt. 11. p. 217.]

i. The maggots in these cases are stated to be *Lucilia hominivorax*, a very common species in Cuba.

ii. The frequency and the serious consequences of myiasis due to the screw-worm fly (*Cochliomyia macellaria*) are mentioned. For maggots in the nasal fossae the author very strongly recommends ethyl chloride by insufflation or irrigation or in pomade.

iii. Several cases of myiasis due to *Chrysomyia bezziana* were reported during the year.

iv. Eggs of *Dermatobia hominis* found on abdomen of a mosquito (*Psorophora posticata*) in Brazil. A. A.

BODET. **Notes sur quelques cas de pseudo-myase rampante ou oerbiss, ou pseudo-draconculose observés à Tamatave.**—*Ann. de Med. et de Pharm. Colon.* Paris. 1920. (Numéro exceptionnel.) pp. 50–56. [1 ref.]

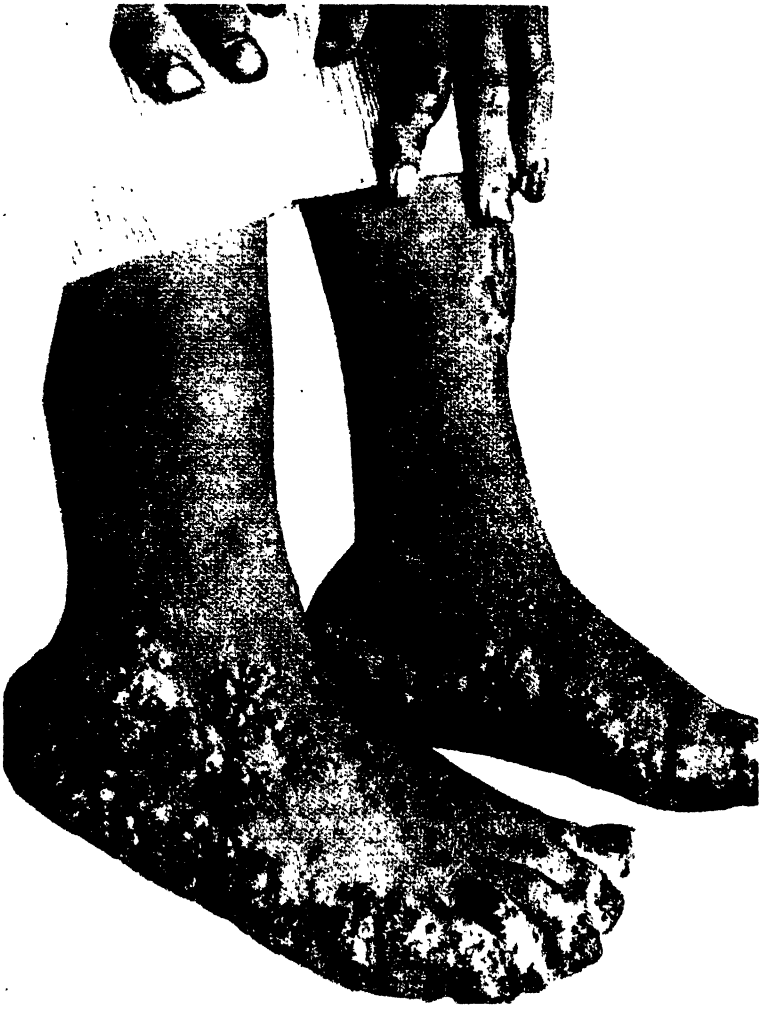
The lesion, simulating creeping myiasis and guineaworm, here discussed is a sinuous, rapidly progressive, cord-like swelling of the epidermis, occurring usually on the dorsum of the foot near the toes; there is little or no inflammatory reaction, but intense itching, particularly at night. When the lesion is opened up throughout its course, all that is found is a clear or opalescent fluid, with perhaps some leucocytes and epidermal debris. Of the nine cases here described, three were in little children and six in recruits over 18 years of age; some of the latter spoke of it as "Ver senegalais"; the Malagasy name for it is "Parasy-kankana" (= flea-worm). In two children's cases the eruption was in the neighbourhood of the anus. In one of the adult cases the swelling somewhat resembled the track of a guineaworm. In all cases the incisions made by free opening healed under a simple dressing. Although no parasite was detected in the track, or in the fluid, or on the dressings, the lesion looks like the work of a parasite. Is it a nematode, or the maggot of some fly, or an acarine, or a flea? The author suggests that it may be a female chigger behaving strangely as a result of not having been fertilized.

A. A.

DA MATTA (Alfredo). **Dermatophylose.**—*Amazonas Med.* Manaos. 1922. Year 4. Vol. 4. Nos. 13–16. pp. 126–129. With 1 plate.

The accompanying illustration of a case of extensive infestation by chiggers (*Dermatophilus*, or as, according to JORDAN & ROTHSCHILD, it should now be known, *Tunga penetrans*), from the Lower Amazons, sufficiently describes this paper.

A. A.



Profuse infestation with chiggers—*Tunga* (= *Dermatophilus*) *penetrans*.
[Reproduced from the *Amazonas Medico.*]

CRAGG (F. W.) & SWAMINATH (C. S.). **Some Observations on the Bionomics of** *Xenopsylla astia*, **Rothsch.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 979–989. [3 refs.]

These observations were made in Agra in the early part of the hot weather of 1921.

As it is not possible to distinguish between living specimens of *X. astia* and *X. cheopis*, much trouble had to be taken with the identification of the former species after death. In order to obtain eggs of *X. astia* the fleas had to be kept under the nearest possible approach to natural conditions, and even then many of the eggs obtained proved unfertile. The earliest day of hatching of the egg was the fourth, the latest the eighth, the duration of larval life was 6–12 days, and the time spent in the cocoon was 7–14 days—under the temperature and humidity conditions of the experiments. Under ordinary laboratory conditions starved fleas seldom survived more than 24 hours, but at lower temperatures and higher humidity they stuck out for at least a week. *X. astia* was observed to feed on man, but with some hesitation. Many individuals escaped in the laboratory, but the authors did not find a single one taking refuge on them personally, and were not ever aware of being bitten. A. A.

FERGUSON (Eustace W.). **The Distribution of Rat Fleas in Australia.** [Correspondence.]—*Med. Jl. Australia.* 1923. June 9. 10th Year. Vol. 1. No. 23. pp. 653–654.

This is a criticism of a report on common species of Australian fleas that appeared in "Health," of Feb., 1923, p. 52. In that report it is stated that 48 per cent. of 136 fleas collected from rats in Sydney were *Pulex irritans*, whereas the author's long and extensive experience in Sydney is that the percentage of *P. irritans* found on rats in Sydney is 0·1. A. A.

i. CRAGG (F. W.). **Further Records of the Distribution of the Indian Rat Fleas, with a Note on the Correlation between the Prevalence of** *Xenopsylla cheopis* **and Plague Mortality.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 953–961. [1 ref.]

ii. DELANOË (P.). **De la répulsion exercée par le mouton sur les puces.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 96–97. [1 ref.]

i. The author's provisional theory that the prevalence of plague is in direct relation with the prevalence of *Xenopsylla cheopis* and that the default of plague, in an epidemic form at least, is in direct relation with the prevalence of *Xenopsylla astia*, has already been considered in this *Bulletin* (Vol. 19, p. 490). The present paper contains further statistics consonant with the theory.

ii. The author has observed [this *Bulletin*, Vol. 19, p. 842] that the sheep's fleece is fatal to fleas, and his further observations, here reported at length, show that fleas actually flee the presence of sheep. A. A.

i. HOFFMANN (W. H.). **Ueber** *Triatoma flavida*, **eine kubanische Reduviide.**—*Muench. Med. Woch.* 1923. May 11. Vol. 70. No. 19. p. 603.

ii GRÚSZ (Frederick). **Note on the Secretions of the Digestive Glands in** *Phthirus pubis* **L. and their Biological Functions.**—*Parasitology.* 1923. June. Vol. 15. No. 2. pp. 203–204. [5 refs.]

i. The Cuban species formerly described by this author [this *Bulletin*, Vol. 20, p. 421] as *Rhodnius prolixus* turns out to be not that species at all, which is restricted to South America, but *Triatoma flavida.*

ii. To separate the secretion of the salivary glands of the crab-louse from that of the glands in the insect's midgut the author detaches the head and thorax from the abdomen of a number of lice and makes separate extracts from these two parts. The extracts obtained from crushed head-and-thorax of crab-lice are anticoagulant and haemolytic; 0–2 cc. of extract was sufficient to hinder the coagulation of 1 cc. of fresh blood and "in a smaller measure" to dissolve the red blood corpuscles. The extracts obtained from crushed abdomen of crab-lice are coagulant and anti-haemolytic.

We must demur to the arbitrary alteration by the author of the old familiar name of Phthirius, which is a correctly transliterated version of a correctly formed generic derivate from Phtheir, to *Phthirus*; also to the arbitrary concoction of a masculine plural "abdomines" from a neuter singular "abdomen."

A. A.

DUNN (Lawrence H.). **The Ticks of Panama, their Hosts, and the Diseases they Transmit.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 91–104. [8 refs.]

Twenty species of ticks occur in Panama, five of them being species of very wide distribution over the world. Those dangerous or vexatious to man are *Ornithodorus talaje, Amblyomma cajannense* and *A. ovale. O. talaje* is so persistent to man as to be known as the human tick, its habits being those of the bed-bug; its young stages are commonly spent on the black and the brown rat; it has lately been shown up as transmitting relapsing fever in Panama. The two species of Amblyomma are notorious pests to travellers in the bush during the dry season; they are very abundant and attack man and animals indiscriminately.

A. A.

CURTIS (W. L.) & CURTIS (Martha E.). **Otiobiosis, the Ear Tick Disease.** —*Jl. Amer Med. Assoc.* 1923. Apr. 14. Vol. 80. No. 15. pp. 1053–1055. With 2 text figs. [8 refs.]

Otiobiosis stands for invasion of the auditory meatus by *Ornithodorus (Otiobius) megninii.* In describing a case the authors remind us that this tick (the ear-tick) is found in Mexico and several of the Western States of America, and has been carried on stock to South Africa. It enters the meatus as a tiny larva, gorges itself there in 5–12 days, and becomes transformed into a spiny nymph which remains in the ear-passage for several weeks. When full grown, the nymph drops out of the ear and crawls to a hiding-place in a wall or a fence, where it becomes adult, not feeding although, if sexuality be not consummated, it may live for more than a year. The trespass of the larva and nymph in the human ear may give little trouble, or sometimes may cause excruciating pain and give rise to local inflammation. Reports of previous cases in man are here recorded.

A. A.

i. CILENTO (R. W.). **Random Observations on Mite Infestations of Man.**—*Med. Jl. Australia.* 1923. May 19. 10th Year. Vol. 1. No. 20. pp. 552–554. [5 refs.]

ii. FERGUSON (Eustace W.). **Mite Infestation of Man in Australia.** [Correspondence.]—*Ibid.* June 9. 10th Year. Vol. 1. No. 23. p. 653.

i. In searching the Australian literature of infestation of man by mites as a preliminary to the study of the epidemic glandular fever of

Queensland and the general question of mite-borne disease, two cases of infestation by the tropical fowl-mite, *Liponyssus bursa*, have come to the author's notice. [The species of Liponyssus, formerly known as Leiognathus, are usually parasitic on small mammals; they resemble the bird-mites (Dermanyssus) from which, however, they differ in having the chelicerae in both sexes chelate.]

ii. The author in noticing the above paper draws attention to two cases of infestation of human beings in Australia by the rat-parasite, *Liponyssus* (*Leiognathus*) *bacoti*; also to infestations by another species of Liponyssus not exactly identified; also to an outbreak of dermatitis caused by *Pediculoides ventricosus* introduced in dried butter-milk.

A. A.

WALCH (E.). **On *Trombicula deliensis*, probably Carrier of the Pseudotyphus and on other Trombicula Species of Deli.**—*Kitasato Arch. Experim. Med.* Tokio. 1923. Feb. Vol. 5. No. 3. pp. 63–83. With 2 plates. [12 refs.]

This deals with the seven species of Trombicula at present known to exist in Sumatra. The larvae of three of them are known to attack man, and one of these three, *T. deliensis*, which also attacks rats, is not only very much like the larva of the Japanese *T. akamushi*, but also is believed to be the carrier of a pseudotyphus thought to be a variety of Japanese river fever. A useful bibliography is appended.

A. A.

i. LARROUSSE (F.). **Présence au Kef (Tunisie) d'une nouvelle espèce du genre** *Ornithodoros*: *O. Normandi* **n. sp.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. June. Vol. 1. No. 2. pp. 170–177. With 4 text figs.

ii. ARAGÃO (Henrique de Beaurepaire). *Ornithodoros brasiliensis* **n. sp.**—*Brazil-Medico.* 1923. Jan. 13. Year 37. Vol. 1. No. 2. p. 20. With 1 text fig. [2 refs.]

iii. MAJOCCHI (Domenico). **Di un' epidemia di acariasi da grano.**—*Giorn. di Med. Milit.* 1922. July 1. Vol. 70. No. 7. pp. 301–303.

i. *Ornithodorus normandi*, a species recently discovered in the burrows of rodents, in Tunis, is remarkable for its small size; the adult female, which is much larger than the male, is only 3–8 to 4–2 mm. long and 2–4 to 2–8 mm. broad.

ii. A new species from South Brazil, very much resembling *O. brasiliensis*.

iii. Another instance of "epidemic" acariaris due to *Pediculoides ventricosus* infesting, in this case, straw mattresses.

A. A.

MILLS (Ralph G.). **Observations on a Series of Cases of Dermatitis caused by a Liparid Moth, *Euproctis flava* Bremer.**—*China Med. Jl.* 1923. May. Vol. 37. No. 5. pp. 351–371. With 9 text figs. [23 refs.]

This paper contains a very full account of an intensely irritant papulous dermatitis, resembling nettle-rash, caused by the hairs of *Euproctis flava*, a common species of the family of tussock-moths (Lymantridae or Liparidae) in the Far East. The moth, which is of a yellow colour, is otherwise not unlike a silkworm moth; the suspected hairs are hollow and more or less barbed. The dermatitis is not always simple; it is sometimes associated with nausea, vomiting, and diarrhoea, and this, together with the fact that the hairs are hollow, has suggested the existence of a toxin. No toxin, however, has been discovered, and experiment up to the present indicates that the action of the hairs is mechanical. A long bibliographical index is appended.

A. A.

DA MATTA (Alfredo). **Dermatose vesico-urticante produsida por larvas de lepidopteros.**—*Amazonas Med.* Manaos. 1922. Year 4. Vol. 4. Nos. 13–16. pp. 167–170.

Descriptions of a case of vesiculous urticaria caused by the hairy caterpillar of a moth of the Family *Megalopygidae* (Flannel moths) and of the irritant barbed hairs.

A. A.

BAERG (W. J.). **The Effects of the Bite of** *Latrodectus mactans* **Fabr.**—*Jl. Parasit.* 1923. Mar. Vol. 9. No. 3. pp. 161–169. With 1 chart. [1 ref.]

The author, having made some experiments with rats, which convinced him that the bite of *Lathrodectes mactans*, though followed by symptoms very different from those following the bite of an Agelena spider, were not terribly serious to the rats, allowed a *Lathrodectes mactans* to bite his finger, and he here describes the results, which were unpleasant enough notwithstanding that he went to hospital and was treated.

The bite caused sharp pain, which presently became duller, and some swelling and local perspiration. In 20 minutes the arm began to ache and the aching gradually extended to the shoulder, then to the chest, and then to the legs. About four hours after the event his speech and breathing were spasmodic, and he went to bed, sweating profusely and tremorous. The pain in the legs kept him restless all night, and although he was relieved by treatment he suffered various pains and aches through the next day; moreover, a "strip of pimples" appeared, extending from the bitten finger to the elbow. In the second night he got some broken nightmare sleep. In the third morning he suffered from headache, and spasms of aching of the bitten hand, but in the afternoon he was better, though troubled with a tendency to faint on getting up. In the afternoon of the fourth day he went to office and tried to work, but "felt wretched." The fifth day he felt quite well, but there was still pain in the left hand, and the next day this gave way to itching, which lasted several days. The temperature, which had risen after he was bitten, continued fluctuating for about a month.

A. A.

PUBLIC HEALTH REPORTS. 1923. June 22. Vol. 38. No. 25. pp. 1405–1406.—**Fish Poisoning on the U.S.S. "Florida" during 1922,** [1 ref.]

Two outbreaks of fish poisoning among the ward-room officers and servants of the U.S.S. "Florida," in the vicinity of the Virgin Islands, are here recorded. In the first (March, 1922) the fish eaten are known locally as "carang," and by the ship's company as "skipjack." They were caught in the afternoon, salted, put into the refrigerator, and eaten at luncheon the next day; their smell and taste were beyond criticism. The first symptoms—vertigo, nausea and diarrhoea, common to all cases—were noticed three or four hours afterwards; subnormal temperature and retarded pulse were general symptoms. Most of the patients complained of pains in muscles and joints and itching of the skin, and in some cases the joint pains lasted for two or three weeks. In the second epidemic (July) the fish eaten were a barracuda and a carang, caught in the afternoon, salted, put in the refrigerator, and eaten at noon next day, their delectable flavour being a matter of comment. The results, both in form and time, were as above delivered, but the symptoms were more severe. Was the poisoning caused by a toxin or by some subtle inodorous putrefactive change? It is a significant point that the carang caught near Culebra, Porto Rico, and eaten in the U.S.S. "Delaware" did not cause any toxic effects.

A. A.

CAWSTON (F. G.). **Some Molluscan Inhabitants of the Natal Lagoons.**—*South African Jl. of Science.* 1922. Dec. Vol. 19. pp. 277–279.

The author specifies at least seven freshwater mollusca, all hospitable to larval forms of flukes, that may commonly be found in brackish water lagoons in Natal. He states that neither the cercariae issuing from these mollusca nor the mollusca themselves can survive for any length of time in the brackish water [but ANNANDALE in his extensive survey of the fauna of the Chilka Lake, on the Orissa coast of the Bay of Bengal, has observed there numerous freshwater animals living in salt water, and numerous marine forms—even such typically marine animals as sea-anemones and medusae—living in salt water, and has even seen there marine and fresh-water sponges growing together on the same rock]. The seven species observed by the author are *Modiola capensis*, infested with dicrocercal cercariae; *Tiara tuberculata*, heavily infested with cercariae resembling *C. cawstoni*; *Physopsis africana*, the common local intermediary of *Schistosoma haematobium* and *mansoni*; *Limnaea natalensis*, an intermediate host of *Cercaria pigmentosa* and larval forms of Fasciola; *Isidora tropica* and *I. forskali*, sometimes infested with Amphistomes; and *Planorbis pfeifferi*, commonly infested with cystophorous and other cercariae.

A. A.

CLELAND (J. Burton). **The Parasites of Australian Birds.**—Reprinted from *Trans. Roy. Soc. S. Australia.* 1922. Vol. 46. pp. 85–118. [5 refs.]

This, which represents an enormous amount of work, is a classified list of Australian birds in which parasites have been found, the parasites also being classified, though by no means always specifically identified. With the additional hosts and parasites discovered by the author, the number of species of Australian birds now known to harbour parasites is, according to the general nature of the parasitism, as follows: Cestodes in 95 species, Trematodes in 38, Nematodes in 36, Microfilariae in 34, Acanthocephala in 27, fleas on 2, Hippoboscidae on 4, Mallophaga on 118, ticks on 4, mites on 39, Haemosporidia in 47, Haemoflagellates in 12.

A. A.

UNDULANT FEVER.

YAKIMOFF (L.). **La fièvre ondulante au Turkestan russe.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. p. 227.

In 1911, two cases of undulant fever were observed by A. A. KRAMNIK, at Askhabad ; one in a Persian woman, the second in a Russian who had been in Persia ; both were infected by goats' milk, proved by agglutination methods. By the Mission studying malaria in Turkestan, in 1913, agglutination tests were carried out with a strain of *M. melitensis* obtained from NICOLLE, Tunis, on the serum of six goats, one of which proved to be positive. The author thinks that undulant fever also exists in Persia and that probably Persian goats are infected. He states that 90 per cent. of the domestic animals in the district of which Askhabad is the capital, are of Persian origin ; Russian Turkestan and Persia, therefore, may be considered as endemic centres of undulant fever.

P. W. Bassett-Smith.

BALFOUR (Andrew). **Undulant Fever in the Anglo-Egyptian Sudan.** [Correspondence.]—*Jl. Trop. Med. & Hyg.* 1923. Mar. 15. Vol. 26. No. 6. p. 102.

While the writer was at Khartoum a case of undulant fever in a resident post office employee came under his notice, so that the case reported by ARCHIBALD [see this *Bulletin*, Vol. 20, p. 378] is not the first on record for that area. The occurrence of probable cases in the Kassala district was reported by BOUSFIELD, in 1908

P. W. B-S.

BURNET (Et.). **Rapports du** *Micrococcus melitensis* **et du** *B. abortus* **de Bang.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Vol. 3. No. 1. pp. 48-66. [7 refs.]

Investigations with many strains of *M. melitensis* and *B. abortus* convinced the author that the two are really one species. In the guinea-pig he was unable to differentiate them by any known method, though *abortus* was as a rule the more virulent ; when, however, tested on monkeys there was a more marked difference in pathogenicity, these animals resisting doses of *abortus* a thousand times stronger than those required to ensure infection with *M. melitensis*, and the same is probably the case in infection of man, though of this there is as yet no experimental proof.

Differences of pathogenicity are not necessarily a proof of specific difference between the organisms ; the author states that the difference is not greater than that found in different strains of the same organism. He, however, acknowledges that cross immunization experiments are not sufficient to be conclusive. Further work with the two organisms in goats is being carried out as a special study, and is recognized as being very difficult.

[The relationship of the two organisms is without doubt very close but it would be premature to accept their identity until we have further information with human and goat infections. Burnet himself would appear to have modified his views later (see below).]

P. W. B-S.

NICOLLE (Charles), BURNET (Et.), & CONSEIL (E.). **Le microbe de l'avortement épizootique se distingue de celui de la fièvre Méditerranéenne par l'absence de pouvoir pathogène pour l'homme.**—*C.R. Acad. Sci.* Paris. 1923. Apr. 16. Vol. 176. No. 16. pp. 1034–1036. [2 refs.]

The authors were able to determine that various strains of *B. abortus* Bang, obtained from foetal calves and pigs when inoculated into man were non-pathogenic. A dose of 900 millions was used, made from a forty-eight hour culture. With the bovine strains the serum gave at first positive agglutination reactions with both *B. abortus* and *M. melitensis*, but not after the forty-eighth day (two cases); with the porcine strains only one case out of three gave a positive reaction. In no case was there clinical evidence of infection, and the organism was not recovered by blood culture methods.

These results suggest that the *B. abortus* may be substituted for the more dangerous *M. melitensis* for laboratory and diagnostic work.

P. W. B-S.

DENGUE, PAPPATACI, AND UNCLASSED FEVERS.

RICE (Lee). **Dengue Fever. A Clinical Report of the Galveston Epidemic of 1922.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Mar. Vol. 3. No. 2. pp. 73–90. With 7 charts in text. [11 refs.]

This is a report of the epidemic that occurred at Galveston and district in 1922, of which the author has already described the chief epidemiological features [see this *Bulletin*, Vol. 19, p. 752].

Five hundred and sixty-seven cases were particularly studied, in some of which hourly temperature observations showed a sustained high curve in the early stages. It is noticed that jaundice was almost entirely absent, but that uterine and mucous haemorrhages were not uncommon. The incubation period was 4–14 days, and only a partial immunity of short duration was given.

[The same characters were noted in the widespread epidemic which overran Louisiania, described by SCOTT [*loc. cit.*, Vol. 20, p. 383].

P. W. Bassett-Smith.

CHANDLER (Asa C.) & RICE (Lee). **Observations on the Etiology of Dengue Fever.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 233–262. With 6 charts. [18 refs.]

A more detailed description is given of the epidemic of dengue described by RICE [see this *Bulletin*, Vol. 19, p. 752], which affected about 600,000 people in Texas. The infecting mosquito was *Aëdes aegypii* [*Stegomyia fasciata*], but no evidence could be obtained in man or in inoculated animals that a leptospira was the causative agent. The incubation period in experimentally infected cases varied from four to six days.

P. W. B-S.

HOLT (W. L.). **Summary of Dengue Research, October to November 13, 1922.**—*Southern Med. Jl.* 1923. Feb. Vol. 16. No. 2. pp. 112–113.

Blood smears and blood cultures were negative. A guinea-pig inoculated on the second day from case 5, showed peculiar motile organisms, which were found also in guinea-pigs and a rabbit inoculated from it; these bodies are described as flagellate and something like trypanosomes.

Small granules and large round nucleated and flagellate bodies were found in various animals, but their etiological significance is not convincing. From the serum of blood taken from a patient, which had been allowed to stand in the ice chest over night, abundant protozoal (?) organisms, amoeboid and flagellate, were found, similar to those seen in guinea-pigs and rabbit.

[These findings must be confirmed before being accepted, as the flagellates suggest the appearances described by NUTTALL, commonly seen in any blood that has stood for some time, and are mechanical, not vital; for the others, Fallacies and Puzzles in Blood Examination, by A. BALFOUR, might be usefully studied.]

P. W. B-S.

KAKU (Tokue). **Ueber das Denguefieber.**—*Deut. Med. Woch.* 1923. Apr. 6. Vol. 49. No. 14. pp. 441–442.

The author describes a small epidemic of dengue, uncommon in Japan, between the 8th and 20th June, 1922. There were 16 cases, all soldiers of one Company. The fever was of two types, with a single or less commonly a double wave. Slow pulse, joint-pains (13 out of 16), hyperaesthesia of the skin, and an exanthem were noted. In 13 of the cases the urine gave a positive diazo reaction, and in one case the leucocytes were 3,300. He states that the disease was not contagious, but was due to insect bites.

[An epidemic limited to 16 cases spread over 12 days is unlike true dengue, and suggests the spirochaetal fever of IDO, ITO, and WANI.]

P. W. B-S.

i. PEDRO (Antonio). **O dengue em Nictheroy.**—*Brazil Medico.* 1923. Mar. 31. Year 37. Vol. 1. No. 13. pp. 173–177.

ii. GOTO (K.). **On an Epidemic of Dengue Fever on the Pescadores in 1922.**—*Taiwan Igakkai Zasshi.* (*Jl. Med. Assoc. Formosa*). 1923. Mar. No. 227. [In Japanese, English Summary, p. 3.]

i. The author had 55 cases under his care which at first were diagnosed as atypical influenza, but proved to be dengue. Brief records are given of 12 of them together with the differential leucocyte counts.

ii. In an epidemic of dengue fever in the Pescadores (off Formosa) about one-third of the inhabitants were affected. The attacks lasted from 5 to 20 days. There was practically no mortality.

P. W. B-S.

LE COMTE (A.). **Unclassed Fevers.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 24–26. With 1 text fig.

This paper describes a fever type which shows such a striking likeness to dengue, that the light intestinal symptoms and the absence of the terminal rise of temperature (terminal rash present) could hardly justify its description as a separate clinical entity.

W. J. Bais.

BOYD (J. E. M.). **Notes on the Sandfly Group, and some Observations on the Sandfly Fever at Hinaidi Cantonments, 'Iraq.**—*Jl. Roy. Army Med. Corps.* 1923. May. Vol. 40. No. 5. pp. 350–358. With 2 text figs.

This contains little that has not already been reported. The observations were made on the left bank of the Tigris, seven miles south of Bagdad. Only two species of phlebotomus were found, *P. papatasii* and *minutus*, the latter being very scarce. It is stated that the slightest wind prevented the flies coming out, but if the electric fans in a room stopped, they arrived in hundreds and found their way inside mosquito netting with a mesh of twenty-two holes to the inch. It was not until one month after the first sandflies were seen that a case of fever was reported. No repellents were found of use.

P. W. B-S.

STEPHENS (E. A.). **Some Observations on a Pappataci-like Fever occurring in Cuba.**— *U. S. Nav. Med. Bull.* 1923. Mar. Vol. 18. No. 3. pp. 368–370.

In a force landed at Guantanamo bay, Cuba, a small outbreak of a short fever was noted in which the symptoms were very similar to those of phlebotomus fever. The ten patients had been severely bitten by midges, the most common being *Oecacta furens.* All forms of mosquitoes and phlebotomi are stated to have been absent. It was thought that the midges were the carriers of the disease.

P. W. B-S.

LLOYD (I. H.). **Nervous sequelae of Phlebotomous Fever.**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 2. Vol. 26. No. 7. pp. 110–111.

The nervous sequelae, which last 14 to 21 days, are headache, insomnia, mental depression, moroseness, impaired concentration, irritability, and diurnal sleepiness. The reflexes are sluggish. The disease can *per se* induce neurasthenia of any degree.

P. W. B-S.

STOCKER (C. J.). **Bacteriological Notes on an Epidemic of Seven Day Fever.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. pp. 97–99. With 6 charts.

In 1914 an outbreak of a dengue-like fever occurred in the 79th Carnatic Infantry. There were 120 cases between March 9th and the end of July; the first case noticed the day after leaving Bombay and the majority after landing at Rangoon. The chief features were leucopenia, an exanthem, and an irregular fever sometimes of a saddle-back type. Blood cultures were taken from 27 cases, and in 6 a Gram-negative, motile bacillus was obtained which did not ferment glucose, lactose or saccharose. This agglutinated with serum of other cases in dilutions from 1 in 40 to 1 in 160, and from it a sensitized vaccine was made, which appears to have been useful. During the early part of the period at sea, *Culex fatigans* was abundant, but after reaching Rangoon, *Stegomyia fasciata* was the most common mosquito. From the stomachs of these a very similar organism was isolated.

P. W. B-S

VAN DER HOEK- VAN EELDERS (H. G. C.). **Een bijdrage tot de differentieele diagnose tusschen van der Scheersche koorts en Influenza in 't beginstadum bij kinderen.** [The Differential Diagnosis between van der Scheer's Fever and Influenza in the Early Stage in Children.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 93–94.

In influenza the buccal mucosa is deep red in a well-marked narrow zone round the arcus palatoglossus. In van der Scheer's fever the whole of the buccal mucosa is very red and swollen.

W. J. Bais.

i. HONE (Frank S.). **A Further Series of Cases closely resembling Typhus Fever.**—*Med. Jl. Australia.* 1923. Apr. 21. Year 10. Vol. 1. No. 16. pp. 435–443. With 1 text fig. [1 ref.]

——. **A Problem in Epidemiology.** [? Typhus.]—*Health.* Melbourne 1923. June. Vol. 1. No. 6. pp. 153–157. [1 ref.]

ii. BULL (Lionel). **Serological Examinations.**—*Med. Jl. Australia.* 1923. Apr. 21. Year. 10. Vol. 1. No. 16. pp. 443–445. [1 ref.]

i. The author has described 17 cases of a typhus-like fever in the Adelaide district [see this *Bulletin*, Vol. 19, p. 754]. He now records 20 other cases, under observation during the past year. The disease was wider spread ; it is more prevalent in late summer and autumn, though cases occur all the year round ; age and sex are indifferent. For diagnosis, the two most helpful factors are an early leucocytosis, 10,000 to 12,000 in the first week, and in the second week a definite positive Weil-Felix reaction ; as the diagnosis has chiefly to be made from typhoid, these are very important. No causal agent could be ascertained and no insect carrier traced, though much time was spent on the research. The original flour theory has broken down.

ii. The technique for carrying out the Weil-Felix reaction is described, and the author makes the interesting observation that better results were obtained by keeping the tubes for two hours at 37° than at 54°. In the cases tested the titre varied from 1 in 80 to 1 in 10,000. Agglutinins appeared in the blood about the 8th day, at first weak, increasing in convalescence, to disappear 4–5 weeks after the commencement of the illness. In routine examination of all Widal cases, 70 sera gave negative results. The *B. proteus* X_{19} emulsion for the test should not be formalized, but be made from living young cultures ; generally more than one examination is necessary, and a dilution of over 1 in 40 is required for a positive reaction.

P. W. B-S.

LAGRANGE (E.). **A propos d'un cas de pseudo-typhus en Annam.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 105–110. [19 refs.]

The author describes a case of a peculiar fever at Nha-Trang, at first diagnosed as malaria, then plague, typhoid, and finally as pseudotyphus. There was a primary inoculation (from bite of some insect undetermined), glandular enlargement, high fever, toxic symptoms, exanthem, followed by convalescence after 14 days of severe illness. The original sore became necrotic. As the case was single the diagnosis was extremely difficult, but finally it was little in doubt.

P. W. B-S.

ROCKY MOUNTAIN SPOTTED FEVER.

PARKER (R. R.). **Transmission of Rocky Mountain Spotted Fever by the Rabbit Tick** *Haemaphysalis leporispalustris* **Packard.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 39–45. [3 refs.]

The correctness of the view held by the author that the various wild rabbits of Montana were able to maintain the virus of Rocky Mountain fever in the endemic area was fully demonstrated by his experiments. The common rabbit tick, *Haemaphysalis leporispalustris*, transmitted the disease from rabbit to rabbit without the intervention of human infections. A second form, the wood tick, *D. venustus*, is alone responsible for conveying the disease from rodents to man; thus two ticks are implicated, the rabbit tick tending mostly to disseminate the infection in wide endemic areas in which for a time human cases may not be found.

P. W. Bassett-Smith.

SPENCER (R. R.) & PARKER (R. R.). **Rocky Mountain Spotted Fever: Infectivity of Fasting and recently Fed Ticks.**—*Public Health Rep.* 1923. Feb. 23. Vol. 38. No. 8. pp. 333–339. [2 refs.]

A careful series of experiments with healthy guinea-pigs was carried out to determine the relative values of inoculation of the macerated tick contents and feeding as a means of conveying Rocky Mountain fever. The criterion of infection was the development of the disease in the animal, or causation of immunity. The results showed that it was unwise to rely either on feeding or inoculation alone, but the latter method is reliable if tested with recently fed ticks, that is, when the virus has been "reactivated." An infected fed tick contains virulent fever-producing virus, while the unfed infected ticks contain a non-virulent immunity-producing virus. This fact explains the comparatively small number of human cases, and the long period of attachment which is usually necessary to cause infection. It also suggests the possibility that the virus may sometimes die out in the tick when unfed for long periods, "reactivation" by ingestion of blood not having taken place. The same loss of virulence occurs in infected eggs which have been dried for four months; these when injected will give rise to immunity but not to fever.

P. W. B-S.

KELLY (Frank L.). **Weil-Felix Reaction in Rocky Mountain Spotted Fever.**—*Jl. Infect. Dis.* 1923. Mar. Vol. 32. No. 3. pp. 223–225. [7 refs.]

The serum of nine cases of Rocky Mountain spotted fever was tested for evidence of the Weil-Felix reaction. The results were almost uniformly negative, and indicate that the reaction may be of value in differentiating the local fever from typhus.

P. W. B-S.

WOLBACH (S. B.), PINKERTON (Henry) & SCHLESINGER (Monroe J.). **The Cultivation of the Organisms of Rocky Mountain Spotted Fever and Typhus in Tissue Cultures.**—*Proc. Soc. Experim. Biol. & Med.* 1923. Feb. Vol. 20. No. 5. pp. 270–273.

Tissues from infected adult guinea-pigs, taken from the tunica of the testis in those affected with Rocky Mountain fever, and from the cerebral cortex in those with typhus, were grown in plasma from normal guinea-pigs. The virus of Rocky Mountain fever survives and multiplies up to 14 days, and can be transplanted into fresh plasma. The life of the micro-organism corresponds with the length of the survival of the cells of the culture media; multiplication takes place in the endothelial cells of the blood vessels and continues in wandering cells of the same origin. Filamentous forms are occasionally found, like those of *R. prowazeki* as seen in infected lice. With typhus, successful growth for one generation only was obtained and infection of guinea-pigs took place after 8, 11 and 14 days' incubation. Rickettsia bodies were found in sections of the brain cultures, within large wandering amoeboid cells; these cells originate in the blood vessels and meninges. The nerve cells and neurolgia do not survive. The micro-organism of typhus so far has been found to survive in the first generation tissue cultures for 14 days.

P. W. B-S.

NOGUCHI (Hideyo). **Immunity Studies of Rocky Mountain Spotted Fever. I. Usefulness of Immune Serum in Suppressing an Impending Infection.**—*Jl. Experim. Med.* 1923. Mar. 1. Vol. 37. No. 3. pp. 383–394. [22 refs.]

From a large series of experiments the author concludes that a serum protective against the virus of Rocky Mountain spotted fever can be produced in the rabbit, which, if used early, will prevent the virus introduced into a guinea-pig from causing a fatal infection. Within the period of incubation the suppression of the infection is certain, but after the onset of the disease the beneficial effect is nil. As the susceptibility of man and the guinea-pig are so similar, it is recommended that when infection through the bites of ticks or by accident is fairly certain, about 0·2 cc. of the serum per kilo of body-weight (or 0·1 cc. per pound) should be immediately injected, preferably intravenously. For the average adult about 16 cc. would be required.

P. W. B-S.

JAPANESE RIVER FEVER.

ISHIWARA (Kikutaro) & OGATA (Norio). **Vorläufige Mitteilung ueber den Erreger der Tsutsugamushikrankheit.** [The Agent of Japanese River Fever. Preliminary Paper.]—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Apr. 5. Vol. 90. No. 3. pp. 164–167. With 2 plates.

In their experimental work the authors found that guinea-pigs and rabbits were not so satisfactory as monkeys, which, however, were not always obtainable. The virus was present in patients' blood only at the acme of the fever. Cultures made from the blood and injected into the testicle caused enlargement of the organ, the bodies being again found. These in man and monkeys are seen as cocci, diplococci, and in chains, rarely yeast-like, of size from 0·1 μ. to 2·15 μ. The larger ones stain intensely. The small cocci are in enormous numbers in the tissues. They grow best in ascitic fluid media at 30°–32° C., are not like those described by NAGAYO, which are yeast-like and grow on Löffler's medium; nor like the coccus of TANAKA, which is Gram-positive. They also differ in morphology and staining from the bodies of MIYAIJIMA. Immunizing work was all negative, and it is impossible to say at present whether the bodies are causative of the disease or not. The plates show (1) the organism in lymph gland of a patient, stained in the block before cutting; (2) similar conditions in the lymph gland of a monkey; (3) pure culture in ascitic media from blood of patient [this is not clear].

P. W. Bassett-Smith.

KAWAMURA (Rinya). **On the Relation of the Causative Organisms of Tsutsugamushi Disease and the Blood Constituents, also on Weil-Felix's Reaction.**—*Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. pp. 41–45.

Having failed after prolonged observation and experiment to demonstrate that the virus of tsutsugamushi disease was contained in the serum or plasma, although it was present in the whole blood, the author made a thorough examination of the cellular constituents. His experiments proved that the virus was connected neither with the red cells nor with the blood platelets, thus differing from that of typhus, which has been demonstrated by KUSAMA to be in the platelets. By injecting 300 cc. of saline into the peritoneal cavity of infected monkeys and removing the fluid 12 hours later, white cells were obtained which, when centrifuged and injected into non-immune animals, produced the disease in practically the same interval as in control animals when whole blood was used. The virus is found especially in the polynuclear cells, but is not firmly fixed. He found also that a positive Weil-Felix reaction was obtained only up to a dilution of 1 in 50, thus making the test of great value for differentiating tsutsugamushi fever from typhus. The actual causative agent was not isolated nor determined.

P. W. B-S.

OROYA FEVER AND VERRUGA PERUANA.

ARCE (Julián). **Apreciaciones generales sobre el diagnóstico y la clínica. La verruga peruana no genera esplenomegalia.** [General Diagnostic and Clinical Observations. Peruvian Wart does not cause Splenomegaly.]—*An. Facul. de Med. Lima.* 1921. Jan.–Feb. Vol. 4. No. 19. pp. 5–22. With 3 text figs. [1 ref.]

The author evidently does not accept the well-grounded conclusion of the expedition of the Harvard School of Tropical Medicine (1913) that Carrion's disease and verruga peruviana are distinct diseases [see this *Bulletin*, Vol. 7, p. 70, and elsewhere]. Consequently it would only tend to confusion to publish an abstract of his paper.

A. G. B.

ARCE (Julián). **Profilaxis de la verruga peruana, basada en los caracteres etiológicos y epidemiológicos propios de esa enfermedad.**—*An. Facul. de Med. Lima.* 1922. May–June. Vol. 5. No. 1. pp. 58–70. With 1 text fig. [English Summary pp. 73–75.] [4 refs.]

The author describes verruga peruviana or Carrion's disease as having two definite and independent clinical forms, with all the characters of a protozoal disease transmitted by a blood-sucking insect. He states that the etiology is not yet known, for he does not accept *Bartonella bacilliformis* of BARTON and STRONG as proved. He suggests a further detailed study of the various infected zones by organizing a corps of expert investigators to determine the differences between the infected and non-infected regions, and he thinks that the money spent would be well invested.

P. W. Bassett-Smith.

ARCE (Julián). **Un caso de Malaria crónica y verruga peruana. Ataque pernicioso de forma comatosa, atribuido al desarrollo de verrugas cerebrales. Interpretación errónea de la hipertrofia esplénica propia de la malaria crónica, atribuida, igualmente, a la enfermedad de carrión.** [Chronic Malaria and Verruga Peruviana. Cerebral Symptoms and Enlarged Spleen erroneously attributed to Carrion's Disease.]—*An. Facul. de Med. Lima.* 1922. Nov.–Dec. Vol. 5. No. 4. pp. 332–343.

A lengthy description of the case of a woman, aged 30 years, a chronic malarial subject, who had a mild attack of verruga peruviana in October, 1920. The following April cerebral symptoms suddenly supervened after repeated attacks of fever which yielded temporarily to quinine. These attacks and the later cerebral symptoms were ascribed to verruga peruviana [*i.e.* Oroya Fever] and a fatal issue was predicted. Injections of quinine and of cacodylate of sodium resulted, however, in recovery, and later crescents were found in the peripheral blood. The author states that splenomegaly does not occur in Oroya fever unless the patient is also a malarial subject.

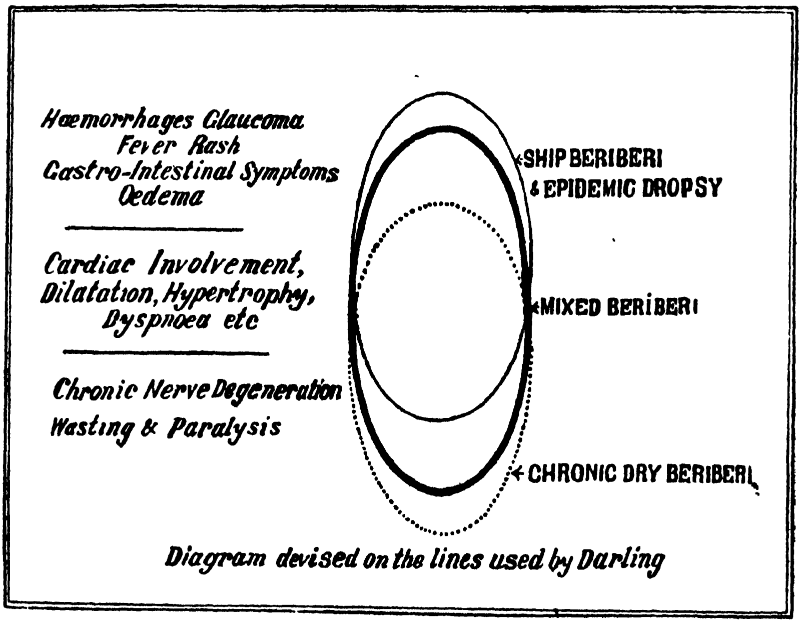
H. Harold Scott.

BERIBERI.

Megaw (J. W. D.). **The Beriberi and Epidemic Dropsy Problem.**—*Indian Med. Gaz.* 1923. Apr. & May. Vol. 58. Nos. 4 & 5. pp. 145–151. With 1 text fig.; 193–203.

The questions propounded in this purely ratiocinative paper are: (1) Is epidemic dropsy a form of beriberi? (2) Is avian polyneuritis the same disease as beriberi? (3) What is the probable cause of beriberi?

1. In approaching the first of these questions, the author dwells upon the ambiguity of accepted definitions, and upon the absence of generally recognized boundaries between the various manifestations included in the terms "beriberi" and "epidemic dropsy," and, in the case of "beriberi," on the great differences between various outbreaks and between individual cases in the same outbreak. He then compares the two diseases in considerable detail in their geographical and seasonal distribution and in their range of symptoms, tabulating the salient symptoms of particular outbreaks of each disease, and he comes to the conclusion that though in the extremes of "beriberi" and "epidemic dropsy" the clinical pictures may be very different, yet that these extremes so inter-graduate as to justify the view that "the diseases have not yet been shown to be different entities." The author illustrates his own views as to the inter-relations of the two different types of what he evidently regards as etiologically one disease in the accompanying diagram, and for his own part he thinks that in "beriberi" observations due consideration has not been given to such easily recorded and distinctive points as pulse rate, blood pressure, nitrogen content of the blood, and post-mortem changes in the heart.



Megaw's Diagram to illustrate inter-relations of beriberi and epidemic dropsy.

[Reproduced from the *Indian Medical Gazette*.]

2. As regards the second question, the author argues that the experimental polyneuritis of animals has been assumed to be identical with beriberi mainly because the two diseases have as common phenomena a degeneration of peripheral nerves associated with a diet of rice (particularly polished rice) and curable by a change of diet. To this argument he objects (1) that polished rice, being deprived of its natural protective layers, is not only deficient in the foodstuffs embodied in those layers, but is also liable to suffer subtle deterioration from moisture and the assaults of microbes; (2) that the vitamin B, in which also polished rice is deficient, is a something about which little is known, and that little not very exact; and (3) that the post-mortem changes in the heart and other tissues are not at all the same in the two diseases. Therefore "it is not safe to conclude that human beriberi is the same as animal avitaminosis." It also is common knowledge that peripheral nerve degeneration is a feature of many forms of chronic intoxication.

3. In the consideration of the third question the argument runs in well-beaten paths, the author passing in review and discussing the evidence for and against the chief theories of causation of beriberi (apparently assuming that beriberi and epidemic dropsy are identical). He does not admit the *all sufficiency* of the vitamin B deficiency theory; he is not disposed to ignore entirely the intestinal intoxication factor; and he leans strongly towards the rice-intoxication theory, the toxin, in his opinion, being formed in old rice particularly when it is not stored in the form of paddy. (1) As regards the vitamin B deficiency theory, he allows that vitamin deficiency may play an important part in some outbreaks of beriberi; but he again touches on the haziness of the particular vitamin B, and insists on the fact, within his own experience, that many cases of beriberi have an incubation period far too short to be attributed to vitamin deficiency; furthermore, he analyses the well-known experiments of STRONG and COWELL on the Bilibid prisoners, pointing out that the experimental diets appear to have been by no means devoid of vitamin B, while their protein value was low, and suggesting that the puzzling symptoms recorded might imply a concurrent protein starvation. (2) In discussing the rice-intoxication theory, he emphasizes the following points as congruent with that theory: the gastro-intestinal irritation followed by neuritis and cardiac implication; the general resemblance of symptoms to those of such intoxications as alcohol, arsenic, or ergot; the seasonal association of the disease with the time when old stored rice comes into use; the often sudden appearance of the disease among people whose diet exhibits no obvious change, or among people whose diet is richer than that of their neighbours both in nutritive value and in vitamin B; the repeated appearance of the disease in ships like the R.I.M.S. "Investigator" [in the reviewer's personal experience of four years a well-found ship, lavishly and luxuriously rationed according to Indian native standards], and its frequent reappearance in particular houses; the ratio of the severity of the disease to the amount of incriminated rice consumed; the shortness of incubation in certain well authenticated cases; the implication of sucklings of affected mothers; and the freedom of Calcutta from the disease since the establishment of numerous rice mills where rice is stored as paddy and whence it issues in a constant stream in the prepared form. Of infantile beriberi he has no personal experience; but he remarks that "if [it] is a vitamin deficiency disease it is remarkable that the cardiac condition should be so different from that of animals suffering from avitaminosis."

An objection to the rice-intoxication theory, that beriberi (including epidemic dropsy) has occasionally occurred in persons who do not usually eat rice, is met by the mere surmise that rice may have been used as an adulteration of other flour.

In thus supporting the rice-intoxication theory, the author does not ignore the anti-neuritic accessory food factor and suggests that deficiency of vitamin B may play a part similar to that taken by malnutrition in dysentery. Nor does he overlook the importance of the objection that no poison, or poisons, have yet been traced.

The paper is characterized throughout by temperance and judgement, and gives us the reflections of a humane mind, though not, perhaps, of that type of humane mind, applauded by HOBBES, whose delight centres unswervingly in exact definitions "purged and snuffed from ambiguity."

A. Alcock.

MEGAW (J. W. D.) & BANERJI (R. N.). **Two Family Outbreaks of the Epidemic Dropsy Type of Beri-beri.**—*Indian Med. Gaz.* 1923. Feb. Vol. 58. No. 2. pp. 49–51.

In 1919–20 Banerji found 12 persons in one family at Allahabad suffering from gastro-intestinal symptoms, swelling of feet and legs, irregular fever, and tendency to haemorrhages in the skin, mucous membranes, and eye; in 10 of the 12 the knee reflexes were increased, in the other 2 absent. There were two deaths. The disease was evidently attributable to the rice ration, as the severity of the case was proportional to the amount eaten, and recovery followed its prohibition. In Megaw's group, also at Allahabad, there were four of one family less severely affected than the first, with no haemorrhages, but absent knee jerks; the best polished rice was said to have been used.

The authors state that at present epidemic dropsy cannot be differentiated from beriberi. In the cases reported there was no evidence of vitamin deficiency; the same food had been used for years, and often neighbours who did not suffer had a less satisfactory diet; one patient contracted the disease after *only a few days'* residence in the town. They considered it to be not infectious but due to some accidental contamination of part of the rice, perhaps caused by the hoarding of the sample to obtain a higher price.

These outbreaks are evidence that epidemic dropsy and beriberi are caused by a poison germinating in rice under certain conditions, and point to the necessity of a reconsideration of our views on the epidemiology of beriberi.

P. W. B-S.

i. JANSEN (B. C. P.). **On the Need of Anti-Beri-Beri Vitamin of the Animal Organism and on the Amount of this Vitamin in Different Foodstuffs.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Pt. 1. pp. 1–122. With 2 charts. [60 refs.]

ii. ——. **On the Nutrient Value and the Ferment-Content of 100 Years Old Rice.**—*Ibid.* pp. 123-135. [7 refs.]

i. In this very elaborate investigation of various foodstuffs used by the people, the author found that mammals in general were not reliable for the tests, and he, therefore, used pigeons throughout. He states that the quantity of anti-beriberi vitamin needed daily by a pigeon is not a constant factor, but depends upon (1) the amount of food taken daily; if the composition of the food is unaltered the amount of the vitamin needed is proportional to the quantity of food taken; (2) the kind of food; the variations are great and it cannot as yet be stated how much vitamin will be required. After testing a large number of foods he shows that in the great majority of accessory foodstuffs the vitamin value is very low and his hope of finding one which would supply the want when the diet is polished rice was not fulfilled. The best was djawawut, but this is little cultivated. The following have (*a*) more vitamin than is required for their own metabolism: bran, djawawut, eggs, meat (heart, etc.), katjangidjo, pea-nuts, kanari beans; (*b*) enough for their own metabolism only: maize, unpolished rice, milk, boiled and canned potatoes, fresh coconut, soy beans, tempe kedele; (*c*) not enough vitamin for own metabolism: white bread, maize-meal, banana, coconut cake, sago, cassava, shrimps, etc.

ii. The writer adds an extraordinary statement that a sample of rice that, owing to insuperable difficulties of transport, had been stored as paddy for 100 years on the extremely fertile plateau of Korintji, was found on recent investigation to have lost, as compared with new rice, none or little of its antiberiberi vitamin, to have suffered little or no change in the composition and digestibility of its protein and in its vitamin A content, and still to contain its natural ferments.

[Of course one would like to have these astonishing results confirmed.]

P. W. B-S.

OKADA (Seizaburo), SAKURAI (Eiichi), IBUKI (Tsukio) & KABESHIMA (Harutoshi). **On the Basal Metabolism in Vitamine B Starvation and in Beri-beri.**—*Japan Med. World.* Tokyo. 1923. May 15. Vol. 3. No. 5. pp. 102–104. [4 refs.]

An investigation was made in mild cases of beriberi with normal or nearly normal basal metabolism, to determine whether changes occur in the basal metabolism as expressed by variations in the respiratory exchange in vitamin B starvation. The main diet was well-polished rice with vitamin-free accessory foods. The analysis of the expired air was made with Haldane gas apparatus.

Seven cases of vitamin B starvation all showed a lowered metabolic activity, which rapidly became normal on vitamin B preparations being supplied. Five of the seven of this group were diagnosed as beriberi and showed at first a normal rate, but when placed on a vitamin B deficiency diet the rate rapidly fell; one of the others was a healthy male; the last a case of ankylostomiasis. Of 28 cases of beriberi (and also in out-patients with marked symptoms) about half showed normal metabolic values; in some a marked diminution occurs in the course of the disease and generally accompanies paralysis and atrophy. The fact that about 80 per cent. of early beriberi cases show a normal rate, indicates that the essential cause is not vitamin B starvation, but further experiments are required to show whether the later symptoms are not due to this deficiency.

P. W. B-S.

KORENCHEVSKY (V.). **Glands of Internal Secretion in Experimental Avian Beri-beri.**—*Jl. Path. & Bact.* 1923. July. Vol. 26. No. 3. pp. 382–388. With 2 plates. [6 refs.]

The author used 54 pigeons in the investigation. The basal diet was polished rice; cod liver oil and citrated lemon-juice were added to provide vitamin A and C, with the addition of autolysed yeast to the controls. The birds were killed in from 24 to 46 days and the glands with internal secretion were removed for examination. The most characteristic changes were (1) hypertrophy of suprarenals, (2) atrophy of thymus, (3) atrophy of spleen with persistence of the islets of the germ centres, often with an increase in their number and size, and frequently hypertrophy and hyperplasia of the islet cells. Other changes not so far considered to be characteristic were (1) presence of a stage of great activity in the thyroid when on a beriberi diet deficient in the fat-soluble factor; (2) tendency to hypertrophy and hyperplasia of the inner secretory interstial cells of the testicle; (3) increased number and hypertrophy of the large light cells of the pituitary body. The thickening of the walls of the small arteries due to hypertrophy of the media and adventitia as observed by YAMAGIWA in man, and in avian beriberi by MCCARRISON, which is one of the fundamental lesions in beriberi, was seen in some of the pigeons.

Two excellent plates show the changes in the testicle, pituitary and spleen.

P. W. B-S.

OGATA (Tomosaburo), KAWAKITA (Shintaro), SUZUKI (Tsui), KAGOSHIMA (Shigeru) & OKA (Chido). **[Our Hypothesis on the Pathogenesis of Beri-beri based on the Experimental Results obtained by our Experimental Vitamine B Deprivation.]**—*Iji Shimbun* (*Med. News.*). 1922. Dec. No. 1107. [Summarized in *Japan Med. World.* Tokyo. 1923. May 15. Vol. 3. No. 5. pp. 106–107.]

The experiments of the authors showed that the results produced by a dietary of polished rice in (so-called) polished rice disease or vitamin B starvation, were different from beriberi. In beriberi the vitamin B content of the viscera is not as a rule different from the normal, the nervous symptoms develop early, and anaemia is not a noticeable factor; whereas in deprivation of vitamin B, anemia is always developed, with a marked change in the white cells, and the nervous symptoms occur later. They, therefore, do not accept the deficiency of vitamin B as a cause of beriberi, but believe that it may be due to an intestinal auto-intoxication from an organism which contains a neurotoxin. [Hamilton WRIGHT's theory.]

P. W. B-S.

i. SAKAI (Masaji). **[Electrical Examination of Nerve Lipoids with Special Reference to Beriberi-like Disease of Fowls and of Human Case of Beriberi.]**—*Okayama Igakkai Zasshi.* (*Jl. of Okayama Med. Soc.*) 1922. Oct. No. 393. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 33.]

ii. IKUCHI (Ken). **[Contributions to the Knowledge of Blood Findings in So-Called Meningitis and Sucklings' Beriberi.]**—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*) 1922. Oct. Vol. 21. No. 10. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 36.]

iii. HASUI (Nawoye). **[Urine Analysis and Metabolic Experiments in Beriberic Cases.]**—*Nisshin Igaku* (*Progress in Med.*). 1922. Oct. Vol. 12. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 61.]

iv. HAYASHI (Tohru). **[Studies on Acidosis in Beriberi.]**—*Iji Shimbun* (*Med. News*). 1922. Dec. No. 1107. [Summarized in *Japan Med. World.* Tokyo. 1923. May 15. Vol. 3. No. 5. pp. 106–107.]

i. The author used for his experiments alcoholic extract from the sciatic nerves of fowls suffering from polyneuritis. This had more negative charges than had normal nerve, while the serum had less. The negative charge could be made positive by the use of rice bran extract, but the hydrogen-ions were not influenced by them, the alcoholic extract of the diseased nerves having a remarkable H-ion concentration.

ii. In the blood of the meningitis cases basophilic and azurphilic granules with thread granules in the erythrocytes were found, whereas in the blood of suckling (infantile) beriberi only basophilic granules were noted. The condition of the leucocytes was as described by other authors.

iii. The examination of the urine in five cases of beriberi showed that metabolic products are retained in the body. In acute cases the nitrogen constituents and salts are decreased, but during convalescence they are increasingly excreted, first the salts, later the nitrogenous substances. No quantitative change in the secretion of ammonia, amino-acids, or phosphoric acid was detected.

iv. Blood examinations of 82 cases of beriberi showed that in 29 an acidosis was present, diminishing in harmony with the beriberi symptoms. The results of the tests for nitrogenous compounds in the blood were in conformity with those of HASUI.

P. W. B-S.

SCURVY.

EMBREY (Hartley). **The Antiscorbutic Vitamine in some Oriental Fruits and Vegetables.**—*Philippine Jl. Sci.* 1923. Jan. Vol. 22. No. 1. pp. 77–82. With 5 plates. [3 refs.]

The author gives a detailed record with weight-curves of his experiments on guinea-pigs to determine the antiscorbutic value of various foodstuffs. At Manila, of the foods examined, pumelo, cucumber, chico (*Achras sapota*) and guava afforded the most protection ; 10 gm. of each of these given daily protected the animals for nine weeks ; 15 gm. of banana gave similar results ; 15 gm. of kangkong or camote leaves (*Ipomaea*), which are used cooked by the Filipinos as greens, protected for a period of seven to nine weeks. At the Union Medical College, Pekin, 30 gm. of fresh raw persimmon appeared very effective for 24 weeks.

[On a study of the charts it is noticeable that in many instances the weight had fallen markedly at the end of the period, indicating that had the experiment been continued longer the animals would probably have succumbed. Too much value, therefore, must not be attached to the efficacy of the substances given.]

P. W. Bassett-Smith.

GRALKA (Richard). **Ueber die Verteilung des antiskorbutischen Vitamine in frischen Gemusen und aus ihnen hergestellten Dauerpraparaten.** [The Distribution of Antiscorbutic Vitamin in Fresh Vegetable and Permanent Preparations of Them.]—*Jahrbuch f. Kinderheilk.* 1923. Jan. Vol. 100. No. 5–6. pp. 265–280. With 6 charts.

The rapid incidence of scurvy symptoms in 31 male guinea-pigs kept on a basic barley diet, to which was added daily 4 gm. of dried milk, showed that this diet had no antiscorbutic vitamins, though it contained fat-soluble factor, albumen, etc.

A daily ration of 40 gm. of white cabbage or carrot protected, unless these were previously frozen. Fresh pressed carrot juice is rapidly reduced in efficiency by oxidation and drying. He found that vegetable powders were valueless, but a water-containing extract held a certain amount. Rubio, an autolysed carrot extract, contains some, but less protective substance than fresh carrot.

P. W. B-S.

i. LOPEZ-LOMBA (J.) & RANDOIN. **Production du scorbut chez le Cobaye et le Lapin jeune au moyen d'un nouveau régime, complet et biochimiquement équilibré, uniquement dépourvu de facteur C.**—*C.R. Acad. Sci.* Paris. 1923. Apr. 9. Vol. 176. No. 15. pp. 1003–1006. With 1 chart.

ii. —— & ——. **Etude du scorbut produit par un régime complet et biochemiquement équilibré, uniquement dépourvu de facteur C.**—*Ibid.* May 28. No. 22. pp. 1573–1576. With 1 chart.

i. The authors have prepared a basal diet containing haricot beans, which, with the addition daily of 3 cc. of fresh lemon-juice, was able to keep guinea-pigs in perfect health for over 70 days. It has the following composition :—

Flour of white haricots 84 gm.; dried beer yeast 3 gm.; butter fat 4·5 gm.; lactate of calcium 5 gm.; chloride of sodium 1·5 gm.; filter paper 2 gm.

Guinea-pigs on this diet without lemon-juice developed scurvy.

ii. Rabbits and guinea-pigs fed upon a satisfactory diet deficient only in vitamin C showed a loss of weight of from 10 to 30 per cent.; the weight-curve in young rabbits begins to fall in about 38 days, in guinea-pigs in about 14. The softening and loosening of the teeth was noticed in guinea-pigs at all ages, together with the usual bone and haemorrhagic changes. Compared with the control animals, to which lemon-juice had been given, a 40 to 50 per cent. increase was noted in the weight of the suprarenals and thyroids, with little alteration of the kidney and spleen. The testicles lost 12 per cent., the liver about 28, and the thymus about 50 per cent.

P. W. B-S.

MOURIQUAND (G.), MICHEL (Paul) & BERTOYE (Paul). **Accidents scorbutiques chez des Cobayes soumis à un régime antiscorbutique.**—*C.R. Soc. Biol.* 1923. Apr. 21. Vol. 88. No. 13. pp. 1045-1046. [5 refs.]

In a series of 118 guinea-pigs which received the usual basal diet, with from 5 to 40 cc. of fresh lemon-juice, only four showed evidence of scurvy. In the case of each of these there was some unusual circumstance to account for the inefficacy of the antiscorbutic. Therefore 5 cc. or over is protective for as long as 240 days.

P. W. B-S

LOPEZ-LOMBA (J.). **Prolongation de la survie dans le scorbut chez les cobayes thymectomisés.**—*C.R. Soc. Biol.* 1923. July 7. Vol. 89. No. 24. pp. 370–371. [3 refs.]

Experiments on guinea-pigs in a condition of avitaminosis showed that in those in which the thymus gland had been removed life was somewhat prolonged; that is, the absence of this hypervagotonic gland was favourable for the animal under scurvy conditions.

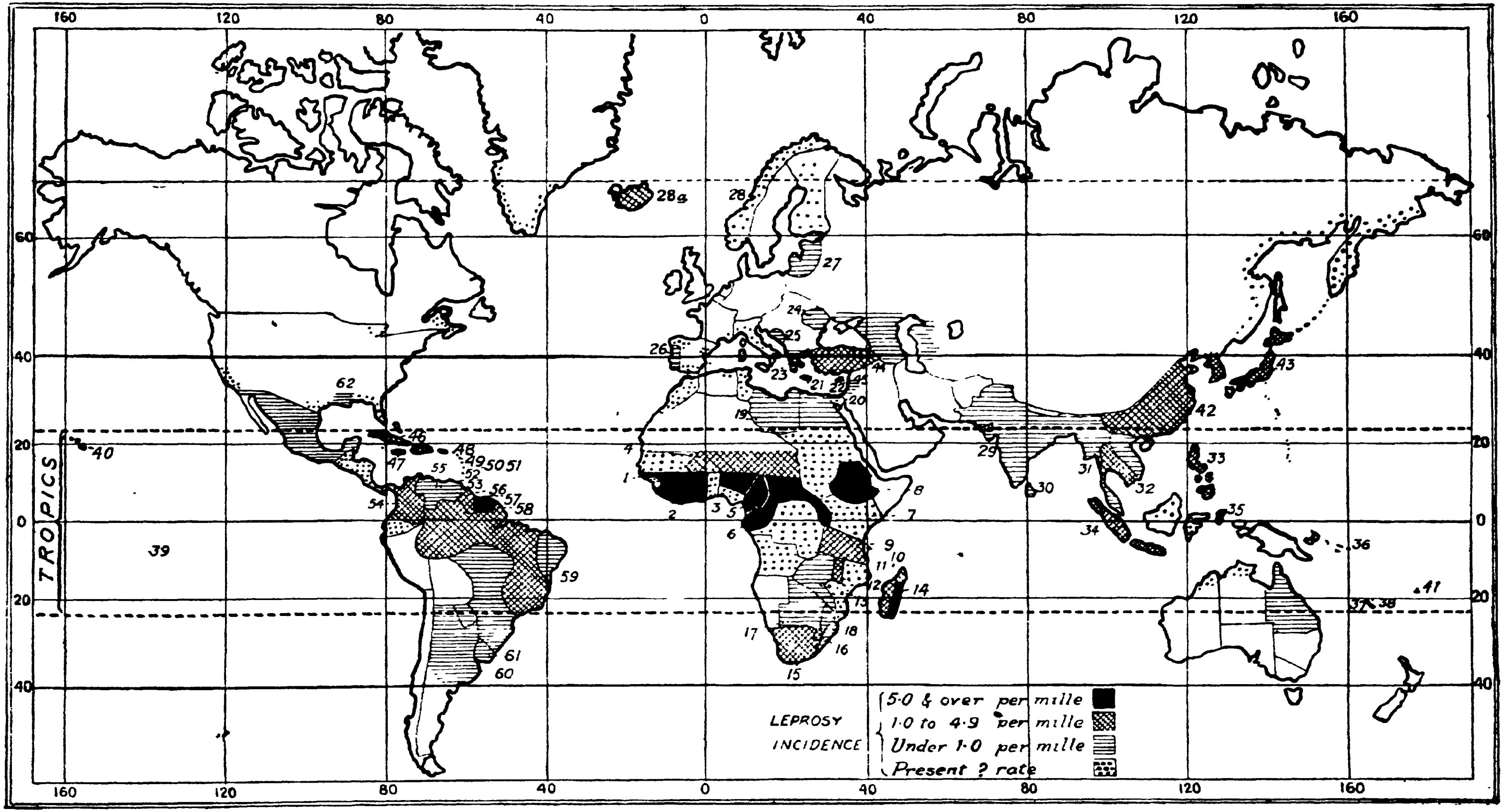
P. W. B-S.

LIOTTA (Domenico). **Sullo scorbuto sperimentale. Nota I—Le moderne vedute sulla etiologia dello scorbuto.** [Experimental Scurvy. Note I—Modern Views as to the Etiology of Scurvy].—*Arch. d. Farmacol. sperimentale Sci. affini.* 1923. June 15. Year 22. Vol. 35. No. 12. pp. 184–191. [38 refs.]

A cursory review of the earlier chemical, the vitamin, and the later calcium deficiency theories as to the etiology of scurvy. The author intends in a future communication to relate his experiments in support of the avitamin hypothesis.

H. Harold Scott.

Map to illustrate world distribution of Leprosy. (After Sir Leonard ROGERS' map in the *Transactions of the Royal Society of Tropical Medicine & Hygiene.*)



LEPROSY.

ROGERS (Leonard). **The World Incidence of Leprosy in Relation to Meteorological Conditions and its Bearing on the Probable Mode of Transmission.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 440–460. With 3 folding maps. (Discussion pp. 460–464.)

Carefully prepared returns show that in hot, humid climates—the Belgian Congo, Cameroon and the French Ivory Coast, for example—the morbidity of leprosy reaches a high figure; in very dry tropical areas, such as Peru and German South-West Africa, the incidence is low, in fact some parts are free; in southern temperate zones cases are few; in the northern, where there is a higher rainfall, the number is greater; in Iceland, where rainfall is high but the external temperature is low, the dwellings are crowded and the room temperature is high and the atmosphere humid, and to this is ascribed the prevalence of the disease. In sub-tropical zones the rainfall and the leprosy rates are intermediate between tropical and temperate, though, naturally, in countries where the sanitary standard is low, one may see a fairly high leprosy incidence with only a moderate rainfall.

A map, carefully drawn up to illustrate the world distribution of this disease, graphically emphasizes the points dealt with in the text.

The general principles of the first part of the paper are applied in detail to India, upon which country the author from long residence and constant study can speak with authority. Here, again, a clear and well-executed map is of great service.

WORLD DISTRIBUTION OF LEPROSY IN RATES PER MILLE [see Map].

	AFRICA.—TROPICAL ZONE.	
1.	French Guinea	5·0
2.	French Ivory Coast	60·7
3.	North Nigeria	5·2
4.	French Sudan	3·0
5.	Cameroon	20·0
6.	French Equatorial Africa	13·0
7.	East Belgian Congo	200·0
8.	Abyssinia	20·0
9.	German East Africa	1·0
10.	Zanzibar	1·0
11.	Comoro Islands	3·5
12.	Nyasaland	1·6
13.	Rhodesia	0·12
14.	Madagascar	3·0
	SUB-TROPICAL ZONE.—23½°—40°.	
15.	South Africa	2·21
16.	Basutoland	1·8
17.	Bechuanaland	0·08
18.	Natal	0·2
19.	Tripoli	0·08
20.	Egypt	0·58
	EUROPE.—SUB-TROPICAL ZONE.	
21.	Crete	3·0
22.	Cyprus	1·06
23.	Greece	0·08
	TEMPERATE ZONE.—40°—90°.	
24.	Roumania	0·09
25.	Herzegovina	0·59
26.	Portugal	0·93
27.	Baltic States	0·2
28.	Norway	0·03
28*a*.	Iceland	1·1
	ASIA AND OCEANA.—TROPICAL ZONE.	
29.	India	0·32
30.	Ceylon	0·16
31.	Siam	2·0
32.	Cochin China	1·67
33.	Philippines	1·3
34.	Sumatra	2·1
35.	Moluccas	3·5
36.	Solomon Islands	4·1
37.	New Caledonia	26·0
38.	Loyalty Islands	35·0
39.	Marquesas Islands	66·7
40.	Hawaii Islands (1894)	11·88
41.	Fiji Islands	2·9
	SUB-TROPICAL ZONE.	
42.	China	1·0
43.	Japan	1·94
44.	Asia Minor	1·0
45.	Palestine	0·86
	WESTERN HEMISPHERE.—TROPICAL ZONE.	
46.	Cuba	1·3
47.	Jamaica	2·0
48.	Dutch West Indies	3·3
49.	Leeward Islands	1·34
50.	Guadaloupe	1·16
51.	Martinique	2·9
52.	Windward Islands	0·92
53.	Trinidad	1·6
54.	Colombia	3·0
55.	Venezuela	0·21
56.	British Guiana	4·0
57.	Dutch Guiana	25·0
58.	French Guiana	11·0
59.	Brazil	0·72
	SUB-TROPICAL ZONE.	
60.	Argentina	0·13
61.	Uruguay	0·05
62.	Louisiana	0·05

The conditions favouring the spread of leprosy are: high relative humidity, close and continued contact, and type of disease—the nodular being the more infective. The writer gives reasons in favour of dermal inoculation as the portal of entry of the bacillus, thus aligning himself with the great authorities on leprosy. The question of an insect vector receives mention, but no definite conclusions are reached beyond the statement that the moisture and warmth possibly permit a lengthening of the period of viability of the bacillus outside the body, while the abundance of insect life and the frequency of small skin abrasions furnish the most favourable conditions for dissemination, scratching of the bites being the most likely means of inoculation. Prevention of contact between healthy and sick, especially during the more susceptible years, up to 25 years of age, constitutes the primary prophylactic measure.

Getting together the facts on which this stimulating paper is based must have occupied much time and called for unremitting attention to detail. The writer remarks that he will be grateful for further data regarding the incidence of leprosy in any part of the world.

H. Harold Scott.

i. ROBINEAU (M.). **La lèpre dans la circonscription d'Ebolowa (Cameroun).**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 193–202. With 3 text figs.

ii. ——. **Quelques remarques cliniques sur la lèpre observées à Ebolowa (Cameroun).**—*Ibid.* Apr. 11. No. 4. pp. 231–236. [3 refs.]

iii. ——. **La lutte contre la lèpre au Cameroun.**—*Ibid.* pp. 253–255.

i. Ebolowa is a well-wooded, mountainous and marshy area in the south of the Cameroons with a hot, humid climate, where the negro population live under most miserable conditions favouring the spread of infectious diseases, and leprosy is very common. From 1 to 2 per cent. of the inhabitants are affected in some areas, while in the Garoua district in the north of the Cameroons 4,860 lepers are present, and in the Ebolowa district they are estimated at 1,500, half of whom are segregated, which gives a percentage of 13 in a population of 106,246 [one of the highest rates in the world]. The neighbouring leprosarium at Yedjang will hold 400, and is well equipped with hospital (medical visits twice a week), dispensary, school, crèche for the infants from their birth, and land for cultivation. The patients on arrival receive seed for their crops and food for the first three months, after which they grow their own food. The number of admissions on a voluntary basis is increasing and desertions are rare. A separate institution for advanced maimed cases with supplies of food is maintained at Ngalan, and two others shelter 247 and 45 patients respectfully. There are also five less efficient leper villages, much being thus done to control and care for the lepers.

ii. In Yedjang, macular leprosy constituted 64 per cent. of the cases, and was either circumscribed or diffuse, but without nodular formation and was nearly equally frequent in males and females; maculo-atrophic leprosy formed 33 per cent. and was more common in females, being frequently accompanied by atrophic lesions of the hands and feet, while tubercular and pigmented leprosy was rare. Leprosy differs from syphilis in being progressive instead of retrogressive. A mixture of ajouni 60 gm. and eucalyptol 40 gm. was injected 1,021 times without accident; chaulmoogra oil 159 gm., 95 per cent. alcohol 30 gm. and ether 35 gm. 4,382 times without sterilization, with 7 abscesses; and atoxyl 10 gm., arrhenal 5 gm. and water 200 gm. 2,898 times without accident—all intramuscularly. The results in 117 cases are given as follows: 13, or 22·4 per cent., of 59 macular cases cleared up, and have been sent back to the villages, while one maculo-atrophic cleared up and 31 more were greatly improved.

iii. All the lepers segregated in scattered villages ought to be collected in leprosaria, as in Madagascar, where 1,424 are isolated in one and 627 in another institution, and at Culion with 8,000 lepers, which simplifies administrative control, supplies more agreeable conditions, and should include a hospital for treating intercurrent diseases, a school for the children, a crèche for infants, and a market. They should be agricultural colonies with land to cultivate, those able to work being separated from the maimed and weak who cannot do so. An estimate given for a colony of 300 lepers works out at 56·25 francs for the first year and 33·45 for succeeding years, so that for the dozen colonies required for the Cameroons the cost would be 270,000 francs the first year and 160,000 francs yearly afterwards.

Leonard Rogers.

MONTPELLIER (J.). **Au sujet de la lèpre en Algérie.**—*Bruxelles-Médical.* 1923. May 3. Vol. 3. No. 27. pp. 658–660. [4 refs.]

Leprosy is rare among the indigenous inhabitants of Algeria, but not so infrequent among Spanish, South American, Maltese and Italian immigrants. In 1918 the author collected records of over 120 cases in Europeans, and now adds details of three new cases—two in Spaniards and one in a Maltese.

L. R.

VALVÊRDE (Belmiro). **La lèpre au Brésil.**—*Presse Méd.* 1923. July 4. Vol. 31. No. 53. (Supplement.) pp. 1105–1108. With 2 text figs. [6 refs.]

Leprosy has been known since 1650 in Rio de Janeiro and is now widespread, its relative prevalence in different States of Brazil having been given in a review of a paper by the same *author* in this *Bulletin* [Vol. 20, p. 482]. The known figures are mentioned in this paper, Para State having 1,452 and San Paulo 3,028, the figures being only fairly complete in these states, out of a total known cases of 7,026, the real number for Brazil being put at 15,000. In Rio de Janeiro, 84 of 88 cases showed nasal lesions, and the author favours the view that this is often the seat of the primary infection, which he attributes to direct transmission, and he does not agree with LUTZ's theory that it is conveyed by Culicidae. Treatment by ethyl ester chaulmoograte has recently been commenced on a large scale and promises well.

During the last four years there has been great activity in providing for the segregation of lepers in institutions in Para, Maranhao, Minas-Geraes, where six million francs are being spent, and at Rio de Janeiro. The new leprosarium at Santo-Angelo, San Paulo State, on which nearly 30 million francs are being spent, will be the finest and best equipped in the world, with ample land around it.

L. R.

LEGER (Marcel). **Comment concevoir la lutte contre la lèpre dans les Colonies françaises ?**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 215–221. [6 refs.]

A general survey of measures against leprosy in the French colonies commences with the statement that in spite of numerous regulations the results are minimal or nil. By learning from former mistakes, a rational and scientific prophylaxis can, however, be formulated, which must primarily be based on efficient treatment of the patients, controlled by accurate bacteriological diagnosis. Dispensaries should be opened with clinical laboratories for the treatment of skin diseases, and hospitals under favourable conditions on the lines of tuberculosis sanatoria, to which lepers will be attracted by the hope of cure. These will be adapted to the customs and social conditions of the individual patients and the stage of the disease, treatment with the various soluble products of chaulmoogra and hydnocarpus oils being supplied.

L. R.

NOËL (P.). **Etiologie et prophylaxie de la lèpre.**—*Rev. Prat. Malad. des Pays Chauds.* 1923. Feb. pp. 50–65. [13 refs.]

After discussing the communicability of leprosy this paper deals with prophylaxis on much the same lines as the above writers, but domicile isolation is advocated for the well-to-do. It is essential to provide better conditions in the leper colonies than the people have in their villages, and the best treatment in order to attract the patients, agricultural colonies being best. Owing to the high mortality among infants separated from their parents at birth and brought up in institutions, he advises, as better, as well as more economical, their being brought up by healthy relatives.

L. R.

BERNUCCI (Felice). **Osservazione sulla innervazione cutanea nella lebbra.** [Cutaneous Innervation in Leprosy.]—*Sperimentale.* 1923. June 18. Vol. 77. No. 1–2. pp. 57–74. With 1 plate. [25 refs.]

In view of the fact that some authorities have stated that leprous nodules retain their cutaneous sensibility intact, whereas, according to others, they are completely anaesthetic, the author undertook the investigation of five groups of cases: (1) with the skin affected in purely anaesthetic leprosy; (2) with skin affected in mixed leprosy; (3) with skin affected in severe nodular leprosy; (4) with skin apparently healthy in severe nodular; (5) with skin apparently healthy in mild nodular leprosy. He tested the sensations to touch, to pressure, pain, and to temperature, and examined pathological material by impregnation methods with chloride of gold and nitrate of silver.

Several cases are recorded in some detail in each of the above five groups and the following embody the results: In the first group (4 cases and 11 pathological examinations), in which sensibility was reduced merely to pressure perception, no traces of cutaneous innervation could be made out, even by the special methods employed; in the second (1 case and 3 "biopsies") there was marked reduction of innervation, the nerves being represented by only one apparently healthy fasciculus; in the third (16 cases, 40 biopsies) all gradations of sensation were found and the changes in the nerves corresponded, varying from almost normal to complete absence, and, in the author's opinion, proportionately. In the fourth group (1 case from which 3 examinations were made), though the skin appeared normal, changes in sensation could be detected and corresponding nerve degenerations were in evidence. In the fifth group, again, there was only one case and no pathological changes were revealed in the nerve supply.

A plate with 12 figures is given illustrating the above points. The paper is interesting and important in its pathological aspects.

H. Harold Scott.

MARCHOUX (E.). **La lèpre de l'homme et la lèpre du rat.**—*Ann. Inst. Pasteur.* 1923. Apr. Vol. 37. No. 4. pp. 342-363. With 1 plate. [3 refs.]

This is a most interesting and complete investigation of a disease mistaken for leprosy in a West Indian patient, who presented rounded brown patches on his face and extremities (but not on the hands or feet), with no alteration of sensation, but with acid resistant bacilli in the skin and nasal mucus, mostly coccoid in appearance. He had febrile reactions after intravenous injections of a soap of cod liver oil, but he developed bullous eruptions and albuminura and left hospital, returning in a dying condition attributed to influenza. A post mortem revealed a streptococcal infection as the cause of death, but the spleen was enlarged and showed innumerable coccial-like acid-fast organisms, which the author named *Mycobacterium pulviforme*. When transmitted to rats by inoculation, it became bacillary in form and undistinguishable from the organism of rat leprosy. The paper is well summed up in the author's following conclusions.

1. An affection occurs in man caused by the development in the tissues of an acid-resistant bacillus differing from the bacillus of Koch and apparently from that of Hansen.
2. This affection differed clinically from leprosy in the case observed in that it produced in its course neither the formation of projecting tubercles nor disturbances of cutaneous sensation.
3. It was characterized by successive series of bullous eruptions followed by the appearance of atonic ulcers and by pigmented scars.
4. It produced a generalized infection which attacked all the organs, apart from the skin and mucosa, and in particular the lymphoid organs, glands and spleen.
5. The pathogenic agent is a small acid-resistant bacillus lying in the tissues in a mass of dust, whence the proposed name of *Mycobacterium pulviforme*.
6. These organisms stain with Gram.
7. They are covered with a thin and fragile film of wax which is impaired with age and often disappears after treatment with xylene. More organisms therefore stain by Gram than by Ziehl's fuchsin.
8. The organisms are intercellular and contained in droplets of lipoid substance which is affected by all grease solvents.
9. This quality renders the study of sections difficult. The enclosing liquids dissolve the binding substance and the organisms escape. Osmic acid is satisfactory for fixing the surrounding lipoid, but gives it such an affinity for stains that the organisms are masked.
10. The multiplication of the microbes seems to be restricted by the leprous cell. As a result the clusters of parasitized cells constitute only microscopic tubercles and never enormous tumefactions as in leprosy.
11. The disease cannot be transmitted to rabbit or guinea-pig, a fact which excludes all comparison with tuberculosis.
12. It can be inoculated into the laboratory-bred rat.

13. In the animal the bacillus loses its pulverulent form, that of resistance and quiescence, and takes the vegetative bacillus form.

14. This bacillus has all the characters of that which causes rat leprosy. It produces the same lesions in the animal.

15. The obviously better adaptation of the germs for life in the organism of the rat than in that of man seems to indicate that the human affection is derived from the rat.

L. R.

MUIR (E.), assisted by LANDEMAN (E.), ROY (T. N.) & SANTRA (I.). **The Spread of Leprosy throughout the Body from Initial Lesions.**—*Indian Jl. Med. Res.* 1923. Vol. 11. No. 1. pp. 239–295. With 29 figs.

This comprehensive paper, which is intended as an introduction to a further communication on treatment, commences by pointing out that the successful treatment of leprosy does not consist merely in injecting the patients with a special drug, but requires individual attention based on clear ideas of the nature and spread of the disease throughout the body. Treatment may not bring about an absolute cure, in the sense that every bacillus in the body is destroyed ; but a relative cure may be claimed when, in skin leprosy, repeated examinations fail to show fresh lesions or acid-fast bacilli over a period of two years, and when also in nerve leprosy all progressive nerve lesions (as distinguished from permanent destruction of nerve fibres) have been absent for a similar period. In favourable circumstances the authors " think that there is every hope of a relative cure in the majority of cases, even where the disease has become widespread."

As the older nomenclature does not suffice to describe many early cases of leprosy, they divide the disease into skin and nerve leprosy and mixed leprosy.

The *initial lesion* has been studied in nearly 1,000 early cases in which a history of the first noticed lesion was obtainable, the majority being believed to be the primary lesions, and these are plotted topographically in five diagrams, which show (1) an entire absence from the scalp, probably due to its dense structure or its peculiar blood supply ; (2) a preponderance of lesions radiating from the nose as a centre, probably from a nasal infection spreading through the lymphatics of the face ; (3) great excess on the extensor surfaces, which is attributed to their being more exposed than the flexor surfaces to insect bites and other injuries liable to be contaminated by scratching ; (4) escape of the interscapular region, which also is out of reach of the finger nails ; and (5) the excess on the feet, especially the soles, in aboriginal and hillmen, who are especially liable to injury of this part of the body, as compared with dwellers in the alluvial Gangetic plains. All these facts indicate the skin as the site of the entrance of the bacilli, and this inference is supported by the case which they quote of a child of 3 years with a single bacilliferous patch on the cheek, developing after lying on the bed of a leper relative ; and that of a boy, who, living for a year in a house recently occupied by an advanced leper, whose mats and carpets had been left, and wearing shorts that exposed his knees to abrasion, developed the primary lesions on the knees. These facts support the widely held view that the lepra bacilli are inoculated through the skin and nasal mucous membrane by excoriations or by scratching.

The *spread from the initial lesion* is next dealt with and the view of UNNA that the bacilli lie in the lymphatics is upheld against that of

HANSEN that they are intracellular, the lymphatic glands also being involved, but without material enlargement, while the periodicity of the disease indicates that the exacerbations are due to metastatic dissemination of the bacilli and setting free of toxins. A diagram is given to illustrate the possible routes of the bacilli (*a*) from the initial lesions through the lymph spaces either of the skin or of the afferent nerve endings inside the sheath of Henle; (*b*) from the initial or subsequent lesions through the blood-stream to all parts of the body, although as a rule they are able to settle and multiply only in the subepithelial tissues of the skin and mucous membrane and in the vascular or fibrous tissues of the nerves, and are destroyed in other tissues, except, rarely, in the lungs (when they appear in characteristic round clumps in the purulent sputum), but these lung lesions clear up under treatment long before those in the skin; and finally (*c*) from primary or subsequent lesions by auto-inoculation.

The *pathology of leprous lesions* is next considered and those of the skin are classed according to the depth to which the bacilli penetrate into (1) infection of the papillary layer just beneath the epithelial layer, which becomes flattened out, causing depigmentation; (2) involvement of the interfollicular layer, causing bulging of the spaces between the hair follicles and resulting in an infiltration of the skin with characteristic narrow linear prominences, well shown in the illustration; and (3) infection of the subfollicular layer, with still greater thickening of the skin and obliteration of the lines of the hair follicles; this may eventually develop into the nodular form, which is thus only an advanced stage of skin leprosy and not really a primary classificatory feature of the disease, as hitherto supposed. The processes of pigmentation and depigmentation in skins of various shades are next described in detail, and the manner in which some cases of skin leprosy develop into mixed or nerve forms is traced. The whole paper is illustrated by numerous excellent photographs of the conditions described in the text, the importance of the recognition of which in relation to treatment being emphasized.

L. R.

WILSON (R. M.). **Treatment of Leprosy.**—*Southern Med. Jl.* 1923. July. Vol. 16. No. 7. pp. 507–509. With 3 text figs. (Discussion pp. 509–511.)

Chaulmoogra oil has been used in a Korea Mission hospital, first orally since 1908, with checking of the disease in many of the 50 per cent. who could take it that way, and since 1913 by intramuscular injections of the oil boiled up with 1 per cent. gum camphor in 3 to 7 or 8 cc. doses weekly into the buttock on Saturdays, with the result that about 8 to 10 per cent. of early cases recover, while probably in 60 per cent. the disease is arrested. Better results were obtained with the whole oil than with ethyl esters, while sodium gynocardate produced no appreciable results. General hygiene including exercise must be attended to, all who are physically fit being given some work, including cultivation. Some cases after four months' injection treatment were able to maintain their health on the oil by the mouth in doses up to 60 minims three times a day, and ten have been paroled as probable cures.

.L. R.

LAMOUREUX (A.). **Essais de traitement de la lèpre par des injections intraveineuses et par ingestion d'une émulsion d'huile de chaulmoogra.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 227–231.

The author has used STEVENEL's method of intravenous injections of an emulsion of chaulmoogra oil in distilled water after saponifying with normal caustic soda, using 3, 6 or 12 per cent. solutions for injection and up to 25 per cent. orally. Of 10 cases, 6 have been followed up for two to three years, and 4 for a few months only, with amelioration of the condition in all. In those longest under treatment the disease has been maintained in a quiescent state up to two years, but on leaving it off acute exacerbations have occurred.

L. R.

ROGERS (Leonard). **Note on "Defatting" of the Acid-Fast Bacilli of Leprosy and Tubercle by Injections of Chaulmoogrates and Morrhuates.**—*Brit. Med. Jl.* 1923. July 7. p. 11. [7 refs.]

In this note Sir Leonard Rogers gives a brief account of the action of the soluble sodium salts of the unsaturated fatty acids of chaulmoogra oil in leprosy, work upon which he has been engaged since 1916. He showed two years ago that the salts, by depriving the lepra bacilli of their fatty envelope, led to the breaking down of the organisms and thus probably to antibody formation followed by clinical improvement.

The *rationale* of the action appears to be that tissue lipolysis is stimulated and blood lipases increased, for in three untreated lepers these lipases averaged an equivalent of only 0·033 of N/10 sodium hydrate, while the average of nine treated cases was 0·22. Further, it has been found that where the lipase content in leprosy is high, a good prognosis is justified, and the same perhaps holds good for tuberculosis, in many cases of which at least the ferment is deficient. The chief interest of this communication lies in the fact that the author by use of chaulmoogra oil derivatives, as recorded by him in 1921, has produced a "defatting" of lepra bacilli *in vivo* analogous to Professor DREYER's results on tubercle bacilli *in vitro.*

H. Harold Scott.

LECLERC (Henri). **Les plantes médicinales des colonies françaises : le Chaulmoogra.**—*Presse Méd.* 1923. June 30. Vol. 31. No. 52. (Supplement.) pp. 1088–1091. With 1 fig. [10 refs.]

In south-eastern Asia, chaulmoogra oil has from time out of mind been a reputed specific for skin diseases and particularly in the treatment of leprosy and elephantiasis. The principal sources of the oil are various species of Bixaceae—*Gynocardia odorata* in Eastern Bengal, *Taraktogenos kurzii* in Burma, and several species of Hydnocarpus (*H. heterophylla, H. anthelminthica, H. serrata, H. subintegra, H. microcarpa*), a genus of wide distribution in India, Indo-China, and Malaysia. The oil resembles olive oil in its physical characters, but has a disagreeable smell, a rancid taste, and a persistent acrid burning aftertaste. That from Taraktogenos and Hydnocarpus contains two acids (chaulmoogric and hydnocarpic), small proportions of palmitic acid and phytosterol, and numerous crystallizable substances; that from Gynocardia contains an acid (gynocardic) which is really a mixture of several acids (linolic, palmitic, linolenic, isolinolenic and oleic), a glucoside (gynocardine) and an enzyme (gynocardase).

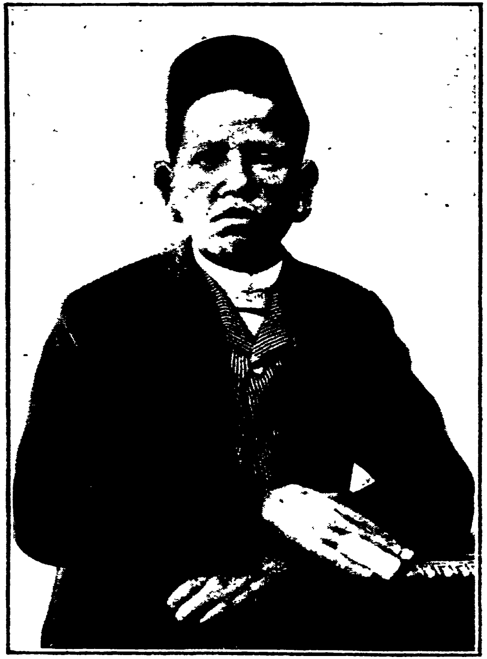


Fig. 1.

[1889.]

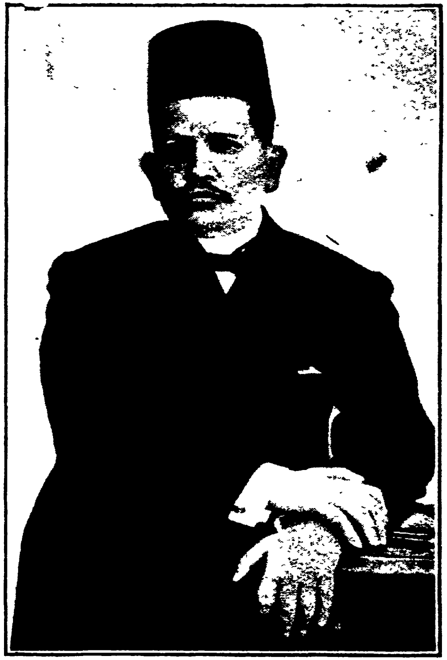


Fig. 2.

[*Circa* 1898–99.]

Results of prolonged (5 years) treatment with subcutaneous injections of chaulmoogra oil in a case of mixed leprosy. [Case reported by TOURTOULIS Bey.]

In Fig. 1 note the dusky leonine face and heavy dull expression, the wrinkled forehead and sunken bridge of the nose, the thickened lips and lobes of ears, the nodules on the right side of chin, the absence of eyebrows, and in the hands the shrunken interosseous muscles.

Chaulmoogra oil was not used in European practice until 1853, when MOUAT, of the Bengal Medical Service, published accounts [*Indian Annals of Medical Science*, Apr., 1854, p. 646] of three cases of leprosy in which indurated glands had subsided and ulcers had completely healed from its employment as an external dressing concurrently with internal daily doses of 6 to 18 grains of pulped seeds. These results [which were published in the hope that an extended application of chaulmoogra in the treatment of leprosy might " secure the general introduction of the remedy "] were confirmed in succession by YOUNG, of Florence, by James STARTIN, by HILLIS, who gave the oil emulsified in milk, by WINSON and LECLERC, of Réunion, by VIDAL, and by HALLOPEAU, who completely cured a case of nodular leprosy after a three years' course of 200–300 drops daily. ROUX, of Paris, in 1890, wrote a thesis on chaulmoogra oil and gynocardic acid, the action of which in leprosy he compared with that of pot. iod. in syphilis.

In order to obviate the digestive disorders attendant on oral administration, JEANSELME introduced the method of subcutaneous injection, which method in the hands of TOURTOULIS Bey, of Cairo, produced (*circa* 1899) the surprising results exhibited in the accompanying illustrations, showing the effect of 584 injections, amounting in all to 2,720 gm. of oil.

[The more recent history of the use of chaulmoogra may be traced in the pages of this *Bulletin*.]

The discovery of the destructive effects (a hundred times greater than those of phenol) of the fatty acids of oil of chaulmoogra upon bacteria, particularly upon the acid-fast species, has led to further modifications of the chaulmoogra treatment of leprosy (and also to hopes, which as yet have not been realized, of their successful employment in the treatment of tuberculosis). Remarkable improvements in leprous ulcers and in leprous infiltrations of the nasal mucosa have been attributed to Bayer antileprol, which is only a preparation of ethylic ethers of oil of chaulmoogra. But as the preparations of chaulmoogric acid are too irritating for intravenous medication, those of the less active gynocardic acid have lately been recommended, and ROGERS has shown how after intravenous injections of sodium gynocardate the lepra bacilli exhibit signs of degeneration, and leprous lesions are ultimately ameliorated, although the immediate effects may be distressing. No doubt ephemeral improvement must be distinguished from definite cures, but the success of these modern methods of treatment is sufficiently well attested to give confidence that "in the age-long duel between leprosy and therapeutics the latter will soon cease to be the eternal vanquished."

A. Alcock.

CORREA NETTO (Orozimbo). **Novas medicações antileprosas.** [New Treatments for Leprosy.]—*Brazil Medico.* 1923. June 9. Year 37. Vol. 1. No. 23. pp. 315–316.

Among several medicaments spoken of three receive special mention, viz., essence of turpentine, salicylate of sodium, and Linser's mixture.

Of the first a " few drops " are injected into the various nodules, some 5 cc. in all being used. An intense reaction is produced, resulting in the formation of abscesses, and when these clear up the nodules disappear.

Good results are recorded from intravenous administration of sodium salicylate, but details as to dosage are not stated.

Linser's mixture consists of neosalvarsan and corrosive sublimate; this also is given by the intravenous route.

The author incidentally mentions a case of nodular leprosy which cleared up spontaneously after the patient contracted smallpox.

H. Harold Scott.

MATTA (Cagliari). **La terapia bismutica nella lepra.**—*Giorn. Ital. d. Malat. Ven . . d. Pelle.* 1923. May. Year 58. Vol. 64. No. 2. pp. 694–697.

The author used Trepol (a salt of bismuth) in the treatment of seven cases of leprosy, three of the nodular variety, and two each of the anaesthetic and the mixed. The dose employed was 2 cc., equivalent to 20 cgm. of the bismuth, and from 20 to 30 injections in all were administered into the gluteal region, one every third day. After each of the first three or four injections there was some degree of local reaction.

In the nodular forms there was a distinct improvement after seven or eight injections, but the condition appeared to come to a standstill about the 18th to 20th; no further amelioration occurred, and if the injections were discontinued the condition returned to its original state. Perforating ulcers seemed to clear up after 10 to 12 injections, and the blood showed an increase in the erythrocytes from three million to four-and-a-half.

Histological examination was made of a leproma excised before treatment was started and of another at its termination, and comparison showed that the plasma and lepra cells were diminished, connective tissue elements increased and the " granuloma took on more the characters of a fibroma."

The bismuth began to be eliminated in the urine in 16–17 hours and could be detected for 30 days after the course of 30 injections.

The author concludes that though bismuth appears to be distinctly beneficial it cannot be regarded as a specific for leprosy.

H. Harold Scott.

EMBREY (Hartley). **A Feeding Experiment on Two Hundred Lepers at Culion Leper Colony, Philippine Islands.**—*Philippine Jl. Sci.* 1923. Apr. Vol. 22. No. 4. pp. 365–386. With 1 plate. [4 refs.]

This experiment was carried out because the chaulmoogra ethyl ester treatment was not very successful in cases of leprosy complicated with syphilis, yaws or tuberculosis, and the official diet was deficient in calorific value, vitamin content and quantity of protein; fish and fresh vegetables were not regularly available. Proteid was added in the form of mungo bean, *Phaseolus aureus*, which is abundant in the islands and cheap, together with abundant vitamin-containing fresh vegetables and fruit, the new diet containing 98 gm. of protein and a total caloric value of 2,807 for adults. During the 31 days of the trial, of the 200 persons, 82 per cent. gained weight, most marked in persons under 50 years of age; 14·5 per cent. lost weight; while of the early cases 90·7 per cent. gained and the rest were stationary. So the additions to the diet were fully justified.

L.·R.

Kolmer (John A.) & Denney (Oswald E.). **The Wassermann Reaction in Leprosy with Special Reference to the New Complement-Fixation Technic.**—*Arch. Dermat. & Syph.* 1923. July. Vol. 8. No. 1. pp. 63–72. [30 refs.]

Since Eitner, in 1906, obtained a positive complement-fixation reaction with an extract of a leprous nodule numerous confirmatory reports on the subject have appeared, with varying percentages of positive results, an epitome of which is given. This has led to leprosy, especially the nodular form, being commonly regarded as yielding non-specific positive Wassermann reactions. The writers recently worked out an improved technique of the reaction, which eliminates several sources of fallacy (see *Amer. Jour. Syphilis*, 1922, Vol. 6, pp. 82 and 496), and which they have now applied to 159 leprosy cases with the following instructive results. In 125 lepers, including 31 nodular and 67 mixed cases, without any evidence of syphilis all the Wassermann reactions were negative with the new complement-fixation test, although with the old one, 9 or 11 per cent. were positive ; in 27 lepers with evidence of complicating syphilis the reactions were all positive, and 7 cases with only a suspicion of syphilis were all negative. The authors' conclusions therefore are :—

"1. In a series of 159 cases of leprosy, clinical or serologic evidence of syphilis was found in twenty-seven, or 17 per cent.

"2. In nonsyphilitic lepers, the Wassermann reactions by a new technic were uniformly negative. With an old technic similar to the original Wassermann method, apparently falsely positive reactions occurred with 7·2 per cent. of serums.

"3. In some cases of leprosy, there is an increased tendency of the serum to yield falsely positive Wassermann reactions ; this is especially true in tests employing alcoholic extracts of tissue saturated with cholesterol.

"4. In the new complement-fixation test for syphilis, this tendency is neutralized by the use of a new antigen largely free from anticomplementary activity and other technical improvements.

"5. Since the new complement-fixation reaction does not yield falsely positive reactions in leprosy, it is of value in differential diagnosis between cases simulating both leprosy and syphilis.

"6. A positive reaction in leprosy with the new method justifies the clinician in proceeding with anti-syphilitic treatment without the mental reservation that he may be uselessly subjecting a leper to unnecessary or even harmful measures."

L. R.

Goodpasture (Ernest W.). **Complement Fixation in Treated and Untreated Leprosy.**—*Philippine Jl. Sci.* 1923. Apr. Vol. 22. No. 4. pp. 425–437. [9 refs.]

Recently the Philippine Health Service has decreased to six months the retention period of lepers who have become bacteriologically negative, on the ground that even if not cured they are no longer a danger, and has encouraged voluntary admissions for treatment now that chaulmoogra oil preparations have furnished a most promising means of combating leprosy on a large scale. A reliable laboratory method of estimating the degree of cure is much to be desired, and the method here described of attaining this end appears to be hopeful, although requiring confirmation on a larger scale. The large amount of work on the Wassermann test in leprosy has been summarized by Cooke [this *Bulletin*, Vol. 15, p. 274], from 1,397 reported cases with positive results in 60 per cent. of nodular and mixed forms and 25 per cent. in purely anaesthetic cases, which cannot all be attributed to coincident syphilis.

With HINTON's method in nodular and mixed cases, the writer obtained 60 per cent. positive reactions in untreated lepers, and 84 per cent. in those treated with chaulmoogra oil preparations for a few months who were still bacteriologically positive, but all negative reactions in 16 cases which had become bacteriologically negative under the same treatment. In five positive untreated lepers, six weeks mercury injections produced no change in the strength of the reactions, so they consider the disappearance of a positive reaction in uncomplicated leprosy cases under chaulmoogra treatment to be associated with the diminution of the acid-fast bacilli, but the large number of untreated lepers giving a negative Wassermann makes this test an unsuitable one for estimating the improvement under treatment. They therefore investigated the use of bacterial antigens, of which they found one prepared from the tubercle bacillus by the following method to be the most satisfactory of five organisms tested.

> "The organisms were grown on glycerinated broth (in the case ot *Bacillus tuberculosis* on glycerinated agar also), the culture suspended in broth, and precipitated by the addition of an equal volume of 95 per cent. alcohol. The precipitate was removed by filtration or by centrifuging, and dried over sulphuric acid. It was weighed and ground in a mortar with sufficient sodium chloride so that, by the addition of distilled water, a 2 per cent. isotonic suspension could be made. The 2 per cent. suspension was shaken thoroughly with glass beads and used as stock antigen. In performing the test a 1 to 10 dilution was used. One cubic centimeter of this dilute antigen was not anti-complementary, and 0·5 cubic centimeter was used as the antigenic dose in each test."

A strain of tubercle bacillus yielding an even milky suspension without flocculi was used, and 24 nodular, mixed, and anaesthetic cases all uniformly gave strongly positive reactions at the beginning of treatment. On the other hand, of 20 nodular and mixed cases, which had become clinically and bacteriologically negative after treatment, only 3 gave complete and 1 more a strongly positive reaction, 14 showed weakly positive, and 2 negative reactions; indicating the test to be of service in measuring the response of patients to treatment.

L. R.

CAPPELLI (J.). **Ricerche sierologiche nella lepra (Comunicazione preventiva).**—*Giorn. Ital. d. Malat. Vener. e d. Pelle.* 1923. May. Year 58. Vol. 64. No. 2. pp. 545-546.

In this preliminary communication the author summarizes his results, the details being reserved for a future paper. The sera of 38 patients were examined, 20 with nodular leprosy, 10 with anaesthetic and 8 with mixed.

They all fixed complement in the presence of syphilitic, leprous or tuberculous antigens, but those of nodular leprosy more powerfully than those from anaesthetic cases. They all contained a natural haemolysin which disappeared in three to six days. Further, the sera, when fresh, had no anti-complementary action; this developed in five to seven days.

Leprous nodules were found to form the best antigens, but extracts of skin of anaesthetic cases and of apparently normal skin of nodular cases were also of service.

The Sachs-Georgi reaction proved positive with very few sera, and this may, therefore, turn out to be a valuable test for distinguishing leprosy from syphilis.

H. Harold Scott.

i. DELAMARE (G.). **Gelure, lèpre nerveuse et ainhum.**—*Rev. Prat. Malad. des Pays Chauds.* 1923. June. pp. 240–259. With 7 text figs. [8 refs.]

ii. MALLANNAH (S.). **An Unusual Infection with** *Bacillus pyocyaneus* **simulating Leprosy.**—*Indian Med. Gaz.* 1923. May. Vol. 58. No. 5. p. 216.

iii. TAMIYA (Sadasuke). **[On the Resistance of the Erythrocytes of Lepers.]**—*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*) 1922. Nov. No. 394. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 52.]

iv. NOC (F.). **Les progrès du traitement de la lèpre. (Revue de pathologie exotique.)**—*Rev. d'Hygiene.* 1922. Nov. Vol. 44. No. 11. pp. 955–968. [37 refs.]

i. A minute description of two nerve cases of leprosy, in one of which an ainhum-like condition was present.

ii. A case of *Bacillus pyocyaneus* simulating leprosy and treated as such although no anaesthesia was present; it cleared up with a vaccine.

iii. Leprous erythrocytes have a high resistance against saponin, especially in the nerve forms of the disease.

iv. This paper gives a general review of the recent literature of the treatment of leprosy without recording any additional facts, and includes a useful list of references.

L. R.

YAWS.

POWELL (Arthur). **Framboesia: History of its Introduction into India; with Personal Observations of over 200 Initial Lesions.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1923. June. Vol. 16. No. 8. pp. 15–42. With 18 text figs. [42 refs.]

Dr. Powell writes:—

" The history of yaws in India taken alone seems to me sufficient to prove that syphilis and yaws are two distinct diseases.

" Syphilis has existed in India for centuries and is specially prevalent among the coolies recruited from distant parts of India to the tea estates of Assam. In the estates under my care from 7 to 10 per cent. of the population were syphilitic.

" Although prevalent in the Dutch Indies, Malaya and Ceylon, no case of yaws had been observed among the three hundred million inhabitants of British India till in December, 1899 [? 1889], after a residence of one and a half years in Assam, I met my first two cases. From these two the disease spread by direct contact till in ten years I personally observed and treated in a narrow strip of land 22 miles long, by 4 wide, 653 cases in a population of about 6,000.

" In 1887 a coolie woman came from Ceylon with three daughters, the youngest being infected with yaws. The other two girls in turn became infected, and were constant visitors to the lines in which cases were first seen by me. These four women called the disease ' faranghi ' while all the other coolies called it ' The New Disease.' "

Afterwards the author lived in Bombay for 19 years. He travelled much, had a large venereal practice, in his capacity of Inspector of Lepers examined many skin conditions, but he saw only one case of yaws, in a pilgrim from Sumatra. He gives details of the spread of the disease in Assam between 1889 and 1900, and later, with a map. Being in charge of indentured coolies and their children he was able to observe his patients at the very appearance of the primary lesion. When the coolies were paraded at roll-call, if a case of yaws had appeared, the native doctor was instructed to register any ulcer, wound, leech-bite or other breach of surface on uninfected men, and these were observed from day to day.

The author has notes of the initial lesion in 205 cases. He has never seen a primary lesion that remotely resembled the ulcers described in the textbooks of BYAM and ARCHIBALD, MANSON-BAHR, and CASTELLANI and CHALMERS. In 43 cases the first sign of the disease was a general eruption in 35–121 days; in seven of these " though no lesion could be seen at the site of presumed inoculation, an ordinary fungating granuloma appeared at a short distance proximal to it; others still more proximal followed in a centrifugal direction till finally a general eruption developed "; three such cases are described. In 162 cases a raised fungating button, identical in all respects with those of the secondary eruption, appeared at the site of the presumed inoculation after 17–68 days. It is carefully described with references to figures. Failing trauma or caustic applications the yaw heals without scar. Ten cases are described illustrating these and other points. Another series illustrates the satellite type, a ring of lesser yaws round the primary. To show the rapidity with which the disease can spread the history is given of a family of seven, six of whom were attacked within three and a half months; vaccination, a leech-bite and scabies provided the points of entry of the virus. A general enlargement of glands was not observed in uncomplicated cases.

In 11 cases the author took secretion from a granuloma and " vaccinated " the donor ; the result was always negative.

Though he has looked carefully for it he has never seen a " prodromal furfuraceous eruption." Children have little fever or joint-ache, adults less than the textbooks seem to indicate.

With the exception of three cases, in two of which yaws was contracted by syphilitic patients, he has never seen any tertiary signs that could possibly be attributed to yaws, but he notes that no patient was under his observation more than 10½ years after inoculation.

Details are given of six cases in which syphilis was inoculated in patients suffering from yaws, and three in which this sequence was reversed. A cracked and pitted form of plantar hyperkeratosis described by CASTELLANI as a sequel of yaws is common in Assam and not rare elsewhere in India : POWELL dissociates it from yaws.

Powell has seen no case of hereditary transmission ; on the other hand seventeen babies born of parents who had yaws during pregnancy were healthy and remained so. He refers with much scepticism to the belief that there is no syphilis in Fiji, and notes that 25 years ago there were in that group 10,000 Assamese coolies who, he is unable to believe, were free from syphilis, and inter-racial intercourse is free. [See HARPER, this *Bulletin*, Vol. 10, pp. 265–6.]

The paper is illustrated pictorially and with a wealth of clinical detail.

A. G. B.

SELLARDS (Andrew Watson), GOODPASTURE (Ernest W.) & DE LEON (Walfiido). **i. Investigations concerning Yaws.**
SELLARDS & GOODPASTURE. **iii. Immunity in Yaws.**
SELLARDS. **iv. Public Health Aspects of Yaws.**
GOODPASTURE. **v. The Histology of Healing Yaws.**
SELLARDS & GOODPASTURE. **vi. Summary concerning the Control of Yaws.**—*Philippine Jl. Sci.* 1923. Mar. Vol. 22. No. 3. pp. 219–220. [2 refs.] ; 233–250. With 2 plates. [10 refs.] ; 251–262. [10 refs.] ; 263–284. With 2 plates. [13 refs.] ; 285–289. [3 refs.]

i. The opening paper of this series tells us that these studies are based on experience of treatment in the Dominican Republic [see this *Bulletin*, Vol. 20, p. 172] and investigations carried on in the suburbs of Manila [*loc. cit.* p. 175].

iii. The subject of immunity in yaws has, as the authors say, received scant attention. Some observers question the existence of a tertiary stage ; the authors are convinced that in many cases the disease terminates spontaneously with the secondary stage and in others lies latent or proceeds to tertiary manifestations ; figures, however, are lacking. Late manifestations are variable. Clavus was very common in Santo Domingo but hard to find at Manila. Distinction must be made between sterilizing immunity and latent infection refractory to reinfection.

To resolve these doubts yaws patients were reinoculated during the secondary stage, both untreated and after treatment with neosalvarsan. The material for the first inoculations was secured by removing the yellow crust from a well-developed yaw and scraping the surface firmly with a scalpel. Smears of the material so obtained contained scanty treponemata. It was reinoculated at once in an incision through the skin, sufficiently deep to cause slight oozing of blood. Observations were made once a week. In the first three cases, of two to five months duration, the result was nil. A group of four patients well advanced in the secondary stage was then similarly inoculated and two weeks later three of these patients were reinoculated in the other arm in two places, a small piece of tissue from a granuloma being implanted. In one of these sites after two weeks there was a round lesion 3 mm. in diameter and 2 in height. A week later the surrounding skin became hyperaemic, but after another week the granuloma was smaller and the hyperaemia was gone. A photograph of this lesion is given. Two cases of clavus with histories of yaws 20 and 13 years before were now inoculated by the implantation method. A week later a papillary eruption was developing in each case but after another week the reactions had almost subsided.

In the second series of experiments small pieces of yaws tissue were implanted in incisions in four cases at the secondary stage, treated with neosalvarsan nearly six months before, and observations were continued for four and a half months. In one patient a typical granuloma developed at the site of inoculation and grew till with the development of early secondary lesions neosalvarsan was given. In the other patients small granulomata developed and in two disappeared spontaneously. Full details are given with the results of the Wassermann reaction, and photographs of the lesions are found. In one instance the lesion was excised and examined ; the appearances were characteristic of yaws.

In view of the favourable results obtained by ALSTON (1911) the serum of patients undergoing salvarsan treatment was given to yaws patients. Neosalvarsan was injected intravenously and serum obtained from the patient's blood several days later. Serum thus obtained from two patients was used in several instances, but without any benefit.

Discussing the reinoculations the authors surmise that their many failures in the untreated cases suggest that the secondary granulomata do not arise readily from accidental transference by the patient to abraded surfaces. They contrast the results with the high percentage of successes obtained by CHARLOUIS (1881). In the treated series only one patient, who had been treated at three months, developed an actively-growing granuloma ; in the others regression was rapid. The authors think that these abortive reactions are due to an active immunity and compare them to the immediate temporary reaction following the vaccination of persons immune to small-pox. Latent infection they think is improbable after neosalvarsan treatment. The results suggest that it is the gradual development of immunity which brings the secondary stage, and often the disease itself, to an end.

Some reflections on cross-immunity in yaws and syphilis are added. The experimental results are conflicting and the authors suggest it would be desirable to demonstrate that some degree of immunity had been established to yaws itself before testing the resistance to syphilis.

iv. The author suggests that the restriction of yaws to warm regions may have to do with the effect of surface temperature upon the development of the granulomata. These show a preference for muco-cutaneous surfaces and regions which are protected by clothing and he instances the observation that in the Mountain Province of Northern Luzon (2,500–5,000 feet), the lesions are largely limited to the mouth, anus and vulva, suggesting that the low temperature inhibits their appearance on the skin.

In many localities yaws may be classed as a disease of childhood: thus at Parañaque 69 per cent. of the cases were in children under 11. To stay the spread it is probably sufficient to treat the primary and secondary stages but on humanitarian grounds and to check the incapacitation caused by tertiary yaws it is imperative to treat latent cases.

He regards a Wassermann outfit as not indispensable, but a valuable adjunct in field work.

As to treatment neosalvarsan stands alone. But " a drug which is efficacious only when injected into the tissues of the body suffers a very real limitation in its general use even in a modern community." Unfortunately, though BROCHARD [this *Bulletin*, Vol. 1, p. 530] obtained good results, salvarsan preparations are not of much value when administered by mouth. Improvement is not rapid enough to render oral administration practicable, and the same objection is raised to tartar emetic by mouth.

The question of the relative advantages of intravenous and intramuscular injection is next taken up. The author found that he could inject two or three times as many patients in a given time intramuscularly and that the therapeutic results were excellent; reaction however was common and sometimes severe. The technique too is simpler. The most serious drawback is the induration at the site of injection. The dosage in field operations was 0·6 gm. for adults, two-thirds of that usually advised. Routine examination of the urine in tropical natives is unnecessary. The comparative cost of the neosalvarsan and the complete iodide and emetic treatment in the Philippines is as 1 : 5.

The author gives the list of articles which form his outfit. He finds that the operation of a dispensary for a single period of a few weeks is altogether inadequate to bring the disease in that area under efficient control; visits are required at intervals of 6 or 12 months.

The available data, largely from the West Indies, show that there is little tendency to recurrence or reinfection after salvarsan treatment.

v. The author says that our understanding of the inflammatory process in the cutaneous lesions of yaws is fairly complete, but it is still undetermined how and where the secondary lesions begin.

In these observations typical early secondary yaws of 1–4 months' duration were removed from four patients before treatment. From one of these a second yaw, as nearly as possible at the same stage, was excised 40 hours after intravenous injection of neosalvarsan. From Case 2 a second and third yaw were excised 3 and 7 days after treatment. From a fifth case a regressing lesion of 4–5 months' duration was removed, and a similar one three days after a neosalvarsan injection.

Sections 1 mm. in thickness were immediately placed in Zenker's fluid and in 10 per cent. formalin. The Zenker material was embedded in paraffin and stained with haematoxylin and eosin; the formalin tissue was stained by Levaditi's silver method.

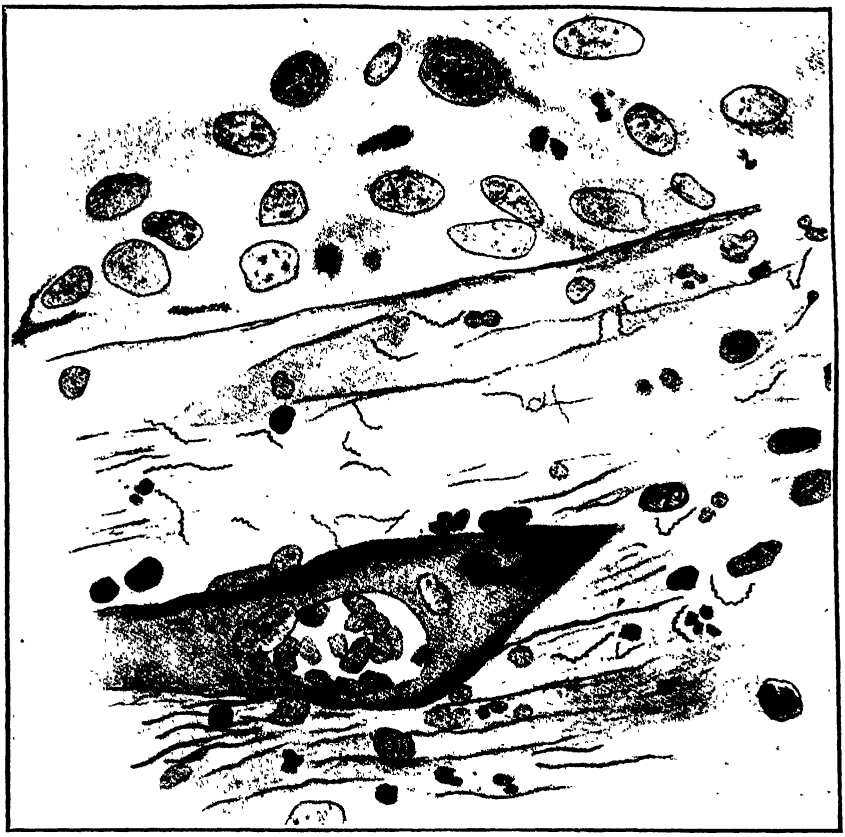
Summary.

" 1. *Treponema pertenue* has been demonstrated by Levaditi's method in abundance in early yaws, not only within the thickened epidermis as heretofore observed, but also within perivascular connective tissue of the papillae. [See figure.]

" 2. The lesions studied indicate that the secondary yaw begins with a localization of treponemata, from the blood, in certain papillae, and from such points the organisms infect the epidermis, where conditions become more favorable for their growth.

" 3. Within forty hours after the injection of a therapeutic dose of neosalvarsan all treponemata demonstrable by Levaditi's method had disappeared from early yaws.

" 4. The remarkably rapid healing of secondary cutaneous lesions after injection of neosalvarsan consists essentially in an almost immediate suppression of acute exudation, and the removal of excessive fluid and cellular exudate by surface evaporation, by absorption, and by phagocytosis. The thickened epidermis quickly resumes normal differentiation with hyperkeratosis for a while until the epithelial layer becomes again of normal width and rapidity of growth.



Camera lucida sketch showing treponemata in oedematous connective tissue about vessel in a papilla in early yaws.

[Reproduced from the *Philippine Journal of Science.*]

" 5. It seems probable that neosalvarsan is destructive of polymorphonuclear leucocytes in the lesions, and this may favor the rapid disintegration of treponemata.

" 6. The older secondary nodular lesions have a more-permanent architecture, heal less rapidly, and probably offer greater protection to treponemata ; consequently, they require more care in effecting a complete cure."

vi. In the closing paper the authors note that while yaws is a loathsome disease its therapy is spectacular. A sufficient degree of immunity is produced. In Santo Domingo the dread of it is pronounced ; infected persons are studiously avoided and by native custom barred absolutely from the villages. Within the home the patient is quarantined in a small outbuilding. No objection was taken to intravenous injection, which was regarded as "magic." The authors find that yaws is "the one outstanding disease of the Tropics through which the immediate confidence and enthusiasm of the people can be secured in public health work." Lastly, efforts in the control of yaws may properly be regarded as a step in the direction of that infinitely more difficult problem, the control of syphilis.

A. G. B.

HUNT (Daniel) & JOHNSON (A. L.). **Yaws, a Study based on over 2,000 Cases treated in American Samoa.**—*U.S. Nav. Med. Bull.* 1923. May. Vol. 18. No. 5. pp. 599–607. With 7 figs.

From the writings of the London Missionary Society the authors conclude that yaws was endemic in the South Sea Islands in 1796 ; the natives date it back to the fifteenth century. In 1921 the cases in American Samoa were estimated from a survey to be 2,500. A campaign of eradication was started and is still in operation, and over 3,000 injections of neoarsphenamine have been given at the hospital and in the villages. The principal agent of transmission is the fly, which breeds chiefly in rotting breadfruits ; it is at these seasons (three a year) that flies are plentiful, and at these times or a little later yaws becomes epidemic ; sores on native children are always covered with flies and white children became infected who lived close to a Samoan village but did not come in contact with natives. They describe the disease partly from their own observations and partly from published accounts. Lesions of the mucous membrane appeared in less than 5 per 1,000 cases, and usually as granulomata of the nasal mucosa. "Snuffles" they found to be common in children during the secondary stage. Painful joints were common and some of the cases might have been taken for rheumatic fever ; these symptoms are alleviated by pot. iod. Nearly 20 per cent. had periostitis on digits, ribs, sternum or long bones ; the authors regard this as a tertiary manifestation. Hyperidrosis was seen in a nurse who six years before received for a secondary eruption 0·6 gm. salvarsan and was now suffering from fissures of the soles ; the symptoms disappeared after 0·9 gm. neoarsphenamine given intravenously. Parenchymatous keratitis was seen, but the authors hesitate to record the diagnosis lest they come to the conclusion that yaws is hereditary ; there is no syphilis. Gangosa, "as it appears in Guam," is never seen in Samoa, but six cases of a lighter form were recorded.

Details are given of the methods used for the control and eradication of yaws. They include the prevention of its introduction from foreign ports, the isolation and treatment of all cases, for which the village chief is held responsible, with inspection of each village twice a month and the destruction of flies and their breeding-places. They find that three intravenous injections of arsphenamine or neoarsphenamine, spread over a period not exceeding three weeks, yield the best results ; 0·9 gm. of neoarsphenamine is the initial dose for an adult.

A. G. B

GOONAWARDENA (J. A. S.). **Parangi in Kolonna.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1923. Jan.–Apr. Vol. 20. Part 1. pp. 11–17.

Yaws patients are treated in Kolonna hospital of which the author is in charge, but not in the districts. Medical officers, he thinks, should be sent to inject the people in their villages or even homes, and roads should be made to all important villages. Untoward results of intravenous injections given by unskilled persons are quoted, and it is suggested that practice with sterilized saline should come first. The author insists on three injections of salvarsan ; most patients who have received only one return, often in a worse condition. Intramuscular injections are quite unsuitable for outdoor work, as the patient is disabled till the next occasion, and moreover he does not wish to submit to a second. The need of sterilization of water and needle does not seem to be always recognized in Ceylon. Like SPITTEL, he considers potassium iodide necessary to complete the cure. One man relapsed after ten injections of salvarsan and he has seen " many similar cases." The iodide should be continued with intermissions for six months.

Yaws will not be eradicated without the co-operation of the villager, and for this his education is essential. The Education Department should in the first place provide for the instruction of the teacher as to what yaws is and how it is spread.

A. G. B.

OHO (O.). **Ueber die Framboesie in Formosa.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 138–148.

The author spent ten years at Taihoku in North Formosa without seeing yaws and then found a focus of the disease in the south-west of the island at nearly 5,000 feet elevation ; he saw 13 patients at one village and 39 at another. Most of the infections had started in childhood and many were now 20 years old and affecting chiefly the palms and soles. The lesions are described. A yaw removed from a boy's back showed the usual histological structure. The natives fear the disease and isolate the subjects of it, keeping their eating and drinking apparatus separate and even refusing to send children to a school where a case has occurred, but the disease spreads. The author concludes that it is chiefly disseminated by the numerous flies which settle on the lesions ; he observed two species of Musca. The disease is limited to a small area in the mountains. The natives treat it by eating the flesh of the scaly ant-eater, and washing the lesions with its broth ; the author suggests that benefit may accrue because their usual diet is one-sided. Salvarsan has the prompt action noted elsewhere and the antimonial antiluetin, given subcutaneously, proved useful ; it has the merits of cheapness and painlessness on injection.

A. G. B.

GAVIÃO GONZAGA (A.). **Contribuição para o estudo da bouba no Brazil.** [Yaws in Brazil.]—*Brazil Medico.* 1923. May 5. Year 37. Vol. 1. No. 18. pp. 248–250. With 1 text fig.

The disease exists in various departments, but, as a result of energetic treatment, is becoming rarer. In some rural districts, however, as many as 60 per cent. are affected. In Ceará the Culicoides is believed to be the chief transmitter, as these crowd over yaws lesions and can only be kept away by the lighting of wood fires.

H. Harold Scott.

VAN NITSEN (R.). **A propos d'un cas de pian.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 263–267.

A case of yaws is described in much detail, showing the polymorphism of the eruption and its tendency to localization round the natural orifices; it was present on the mucosa of the lip [see this *Bulletin*, Vol. 18, p. 251]. The initial lesion was on the prepuce—a rare site. In seven patients the large mononuclear and transitional leucocytes numbered between 16 and 39 per cent.; an increase, the author thinks, is the rule. Of 25 cases examined for the Bordet-Wassermann reaction 23 were positive, in some instances 4–5 days after the appearance of the primary lesion: the reaction is found earlier than in syphilis.

A. G. B.

MÜLLER (Armin). **Framböȿie und Syphilis.**—*Deut. Med. Woch.* 1923. Mar. 9. Vol. 49. No. 10. pp. 309–311. [6 refs.]

That the spironema of yaws is found in the epidermis, of syphilis in the dermis; that mucous membrane is affected in syphilis but spared in yaws; that congenital transmission occurs in syphilis and not in yaws—these distinctions are regarded by the author as adaptations to climate. Yaws is suited to the tropics; syphilis is independent of climatic conditions. The notion seems to be that in a cold climate instead of the virus being shed from any part of the skin it became mainly restricted to mucous membrane and to compensate for this handicap the spironema became able to infect the ovum.

A. G. B.

GOODMAN (Herman) & TRAUB (Eugene F.). **Frambesiform Syphilid. With Report of a Case.**—*Arch. Dermat. & Syph.* 1923. May. Vol. 7. No. 5. pp. 619–624. With 1 text fig. [8 refs.]

The framboesiform syphilide is an uncommon form of secondary syphilis, which according to PRINGLE is frequently taken for impetigo. It is a nodular syphiloma, which becomes crusted, is an early manifestation, and leads to surprising little scarring after recovery, which under treatment is rapid.

A. G. B.

i. REID (C. B. B.). **Treatment of Yaws by Tartar Emetic. Appendix No. 1.**—*Tanganyika Territory Ann. Med. Report.* 1921. p. 54.
ii. SHIRCORE (J. O.). **Notes on the Treatment of Yaws with Bismuthosodium and Potassium Tartrate.**—*Ibid.* pp. 57–61.

i. The author treated 182 cases of yaws with intravenous injections of tartar emetic in doses of 1½ grains at 4–7 days' interval, the solution being of strength 24 gr. to the ounce. Mercury and potassium iodide were given by mouth daily. Of 178 all were discharged free from symptoms after an average stay in hospital of 35 days and an average of 7 injections: 42 have reported periodically for 2–9 months and have remained well. The author thinks that tartar emetic is a valuable adjunct to mercury and iodide, though its action is not to be compared with that of salvarsan.

ii. Mr. McGOWAN at the instance of Shircore produced a sample of bismutho-potassium sodium tartrate from bismuth oxide. Shircore tested it on himself without ill effect, and subsequently on a yaws patient with promising results. More was then prepared but the composition was evidently different and larger doses were needed. Dr. PARRY reports on its use in yaws and syphilis, 42 patients in all. The drug was given intravenously at five days' intervals, the optimum dose being 5–6 grains. He considers that its action is as good as that of salvarsan. It was equally beneficial in the secondary stage of yaws and late manifestations of yaws and syphilis. Of 14 patients treated in hospital the average stay was 13 days, the number of injections 1·8, average amount 9·2 gr. Nine cases of tertiary yaws and syphilis had to be detained 41 days. A standard method of preparation is needed. Spirillum fever in one instance was apparently cut short by the drug.

A. G. B.

GRENADA. **Reports on Intensive Treatment of Yaws in Grenada, (i) for Half Year ended 30th June 1922, and (ii) for Half Year ended 31st December 1922.** [PATERSON (G. W.), Colonial Surgeon.] [M.S. received from the Colonial Office.]

i. The yaws campaign began in May, 1919, so that figures are now available for more than three years. In this period 11,904 patients were injected out of a population of 66,000, but possibly some of the cases figure more than once. The number of tubes of novarsenobillon used was 26,464 and the total expenditure on drugs and injection apparatus £6,617 4*s*. 3*d*. 10,531 cases had been discharged as cured. The statistics show also that the average cost of cases discharged cured has fallen from 19*s*. 11½*d*. in the period prior to December, 1920, to 12*s*. 6½*d*. for the whole period to date.

ii. The second report carries on the story another six months, during which 1,081 cases were seen; 11,656 cases had been discharged cured, and of 1,314 unaccounted for it was presumed that all had recovered. The average cost of treatment had been reduced to just below 12*s*. That the number of cases does not diminish is explained by the fact that old non-infective cases are now presenting themselves; of one district it is said, " Nearly the whole number is made up of old ulcers, and the condition on the sole of the feet known as 'crab.' " Dr. PATERSON reports that owing to the cheaper cost of neosalvarsan (German) as compared with novarsenobillon he has recently employed it but has decided to return to novarsenobillon as the neosalvarsan tends to give rise to abscess formation and is less effective.

A. G. B.

GOODPASTURE (Ernest W.) & DE LEON (Walfrido). **The Effect of Treatment on the Wassermann Reaction in Yaws.**—*Philippine Jl. Sci.* 1923. Mar. Vol. 22. No. 3. pp. 221–231. [8 refs.]

The authors state that since a positive Wassermann reaction is obtained in a large proportion of cases of leprosy free of syphilis and has been often reported in malaria, such positive reactions cannot have the same diagnostic significance in the tropics as in the temperate zone. Like other observers, they have found a positive reaction constantly in yaws, which is very confusing from the standpoint of differential diagnosis. The reaction, however, should be used to establish the efficacy of any treatment of yaws; although in practice it is not necessary to continue treatment until a negative reaction be obtained, yet no case can be regarded as completely cured until that negative reaction is obtained. The reaction is of value in the recognition of latent yaws and in the differentiation of " tropical ulcers " that may be benefited by neosalvarsan from those that have no relation to either syphilis or yaws.

" 1. The Wassermann test was strongly positive in 100 per cent. of 45 patients presenting active cutaneous lesions of yaws.

" 2. Complement-binding strength of titrated serum from yaws is equal to the maximum strength of syphilitic serum.

" 3. Following the clinical cure of yaws by intravenous injection of neosalvarsan, the Wassermann reaction remained positive for many months, gradually weakened and became negative in 7 of 12 cases within six months after treatment.

" 4. Treatment of yaws, in the early secondary stage, with mercury caused no noticeable improvement in the lesions. The Wassermann reaction showed an initial slight weakening in the titre, then remained constant and strongly positive.

" 5. An antigen prepared from an early yaw containing treponemata did not fix complement with sera from yaws patients that were strongly positive with the usual cholesterinized antigen."

The authors used mostly an antigen extract of cholesterinized alcoholic extract of guinea-pig's heart. In a few tests the extract was made from ox heart.

The tests were controlled by normal and syphilitic sera.

H. M. Hanschell.

MISCELLANEOUS.

CAWSTON (F. G.). **The Antimony Treatment in some Tropical Diseases.** —*S. African Med. Rec.* 1922. July 8. Vol. 20. No. 13. pp. 245–248.

This paper, read before the South African Medical Congress, 1921, deals with treatment by antimony in bilharziasis, syphilis, leprosy, and hydatid cyst ; it contains little not previously published.

Antimony has been used in the treatment of fluke-infested sheep and is suggested for infection by *Paragonimus westermanii* and taenia.

For syphilis, ½ to 2 gr. of tartar emetic are given daily intravenously, freshly dissolved in 3 cc. of boiling saline. The total cost of three weeks' treatment is one penny per patient. Illustrative cases are given. Colloidal sulphur was in some instances given as well

A. G. B.

LEVY (M. D.) & DIMMITT (Pauline S.). **A Note on the Effect of Tartar Emetic Intravenously on the Non-Protein Nitrogen of the Blood.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 569–572. [10 refs.]

Six cases from the medical wards after complete blood analyses received tartar emetic intravenously in 2 per cent. solution, six doses of 0·5–5 cc. In three instances the non-protein nitrogen was increased from 75, 33 and 33 mgm. per 100 cc. to 120, 50 and 50. In the first instance albuminuria was noted. The analyses are given in tables, before and after treatment.

A. G. B.

CHOPRA (R. N.) & NAPIER (L. E.). **The Therapeutics of Antimony.**—*Indian Med. Gaz.* 1923. Jan. Vol. 58. No. 1. pp. 1–7. With 6 graphs. [15 refs.]

This paper is mainly a summary of the therapeutic uses of the salts of antimony and the methods of administration. The original matter consists in a description of the results of injection of potassium antimony tartrate, sodium antimony tartrate, stibacetin and stibamine into the thigh muscles of rabbits. The degree of oedema, necrosis and haemorrhage are compared in each case and it was found that the severity decreased in the order given above. The effect of potassium and sodium antimony tartrate on the heart, blood pressure and respiration is shown in a series of graphs. When the drugs are injected slowly, as is done clinically, there is little change, but when done suddenly there is a very marked and sudden fall in the blood pressure. In the isolated rabbit's heart a depression is noted. The sodium and potassium salts and stibenyl produce similar results.

C. M. Wenyon.

DUTT (Madan Mohan). **Studies on Quinine.**—*Calcutta Med. Jl.* 1922. Nov. Vol. 17. No. 5. pp. 201–231.

Among the studies here recorded we may take note of some simple experiments on the effects of dilute solutions of several salts of quinine on amoebae and paramoecia.

They show that in solutions of 1 in 2,000 quinine hydrochloride is much more toxic, though in weaker solutions (1 in 10,000 and upwards) not more toxic, than quinine bihydrochloride ; (2) that in solutions of 1 in 2,000 to 1 in 20,000 the bihydrochloride is decidedly more toxic, though in solutions of 1 in 40,000 only a little more toxic, than quinine sulphate ; (3) that in solutions of 1 in 40,000 the sulphate is decidedly more toxic, though in weaker solutions not so very much more toxic, than the bisulphate ; (4) that in all dilutions (1 in 2,000 to 1 in 40,000) the bisulphate is, for amoebae, more toxic than the hydrobromate, and the hydrobromate than the bihydrobromate ; and (5) that even in dilutions of 1 in 2,000 quinine tannate has no effect, or very little. Some further experiments show that the most toxic of these quinine salts—the hydrochloride—in dilutions of 1 in 6,500 and 1 in 40,000 is to paramoecia very much less toxic than corresponding dilutions of arsenic. [These experiments do not appear to take cognizance of ACTON's experiments (this *Bulletin*, Vol. 19, p. 103), showing that the amount of a cinchona alkaloid necessary to kill paramoecia is very considerably determined by the hydrogen-ion concentration of the medium.]

A. Alcock.

BARNES (Milford E.). **Intolerance of Quinine. A Case Report.**—*Jl. Trop. Med. & Hyg.* 1922. Aug. 1. Vol. 25. No. 15. pp. 246–248.

On four different occasions, three of them under daily observation, the ingestion of the bisulphate or bihydrochloride of quinine produced vesicular dermatitis of the toes, fingers and scrotum of a Chinaman, accompanied by intense itching, and followed by desquamation. Purpura also occurred. The infection was with *Plasmodium vivax*. During an apyretic interval, the man being upon Fowler's solution, he also received 1 gr. of quinine sulphate in divided doses during the 24 hours, the amount being gradually increased until he was taking 2 gr. daily with no untoward effects. Quinine was then dropped for a month, after which 10 gr. daily for two days produced no inconvenience. Yet when quinine was given two months later during a malarial attack the discomfort was as great as ever. The state of blood coagulability is not mentioned.

Clayton Lane.

i. FIGDOR (Philip) ; PINNOCK (D. Denham). ii. BRODRIBB (C.). **Quinine Necrosis of Muscle.** [Memoranda.]—*Brit. Med. Jl.* 1922. July 1 & 15. p. 14 ; p. 109.

i. The patient contracted malaria in Salonika in 1916, when he had " about 49 " injections of quinine into each buttock alternately every other day. Later he noticed at first several swellings, then one " big lump," which was the condition when he was seen in 1921 by the authors. There was then a cigar-shaped swelling some 3 in. long in the right buttock, which moved freely and caused discomfort. It was therefore cut down on. An adventitious bursal sac in the upper part of the gluteus muscle was opened in which a greyish-white cigar-shaped body lay quite free. Examination proved it to consist of necrosed muscle fibre, and it is suggested that the necrosis was owing to the direct action of quinine and to pressure of the injected fluid in the muscle bundle cutting off its blood supply. The specimen is in the Museum of the Royal College of Surgeons.

ii. Major Brodribb suggests that quinine necrosis will not occur if the injections are dilute. He uses 5 gr. in 10 cc. of diluent both for intramuscular and intravenous injections, and, with an extensive experience, has seen no ill effects.

A. G. B.

LEVADITI (C.) & NICOLAU (S.). **Vaccine et néoplasmes.**—*C. R. Acad. Sci.* 1922. June 19. Vol. 174. No. 25. pp. 1649–1652.

Some of the work of Levaditi and his collaborators on a group of filterable viruses (" ultra-viruses ") having an affinity for tissues derived from the the ectoderm has already been noticed in this *Bulletin* [Vol. 19, p. 618; Vol. 20, p. 7]. In the present paper are recorded the results of some experiments undertaken to determine the relations between neurovaccine (an " epitheliotropic " virus adaptively " neurotropic ") and cancers and sarcomas experimentally produced in rats and mice. These experiments confirm the conclusion that neurovaccine (vaccinia virus) has a natural affinity for epithelial and germinal cells and no affinity for tissues derived from the mesoderm, and they also carry the inference that the cells of a neoplasm have vital aptitudes of their own apart from the tissues of the host. The following is a summary of the results of these experiments.

1. When neurovaccine is injected into a well-developed epithelial tumour the tumour increases in size and produces an abundant culture of the virus ; but when it is injected into a sarcoma it not only does not " take " but it is also either completely destroyed or grows badly. The same things happen when the neurovaccine is injected, not into the tumour direct, but into the blood of the affected animal.

2. The vaccinated epithelial tumour usually loses its power of striking when grafted into new animals ; rarely a graft does grow, and continues receptive to the vaccinal virus.

3. When a graft from an epithelioma is implanted into a rat that has already been vaccinated by inoculation into the skin the graft grows into a tumour, but the tumour is immune to vaccinia virus, though grafts taken from it are found soon to regain their receptivity ; that is to say the neoplasm developed in the already immunized animal borrows immunity only so long as it remains in actual continuity with that animal.

4. On the other hand an epithelioma developing in an ordinary (unimmunized) rat and then thoroughly inoculated with vaccinal virus is found to be quite susceptible to fresh inoculation 30 days afterwards—an interval long enough for acquisition of immunity by intracutaneous vaccination.

A. A.

JANCOU (A.). **Vaccination de l'Homme par la Neurovaccine.**—*C. R. Soc. Biol.* 1922. May 6. Vol. 86. No. 16. pp. 910–911. [2 refs.]

The neurovaccine (of LEVADITI & NICOLAU) is vaccinia virus cultivated in the brain of the rabbit. Its particular recommendation is said to be complete freedom from any complicating organisms ; if, as occasionally may happen, it does cause local oedema and inflammation, this is to be explained as an idiosyncrasy. In 30 vaccinations of new-born infants the author obtained a positive result in 70 per cent. ; and in 289 adults, most of whom had been vaccinated at some time previously, a positive result was obtained in 37 per cent.

A. A.

MACCALLUM (W. G.) & OPPENHEIMER (Ella Hutzler). **Differential Centrifugalization : A Method for the Study of Filtrable Viruses, as applied to Vaccinia.**—*Jl. Amer. Med. Assoc.* 1922. Feb. 11. Vol. 78. No. 6. pp. 410–411.

By centrifugation the authors have been able to separate from vaccinia lymph myriads of minute granules, very much smaller than streptococci or staphylococci, which apparently are identical with the granules seen in tissues and smears from vaccinia and smallpox by PROWAZEK, PASCHEN, HALLENBERGER and others.

The lymph operated on was a viscid turbid fluid containing 2·34 per cent. of glycerine and having a sp. gr. 1·638. Centrifugated at high speed for an hour it separated into a solid sediment, a thick turbid layer, and a superficial less turbid layer. Corneal inoculation (rabbit) from the top layer alone produced a typical vaccine lesion.

The top layer was drawn off into a very narrow test-tube and made up to 1 cc. with Locke's solution. The mixture, sp. gr. (at 24° C.) 0·99, was centrifugated and inoculated as before: the infective virus was now found in the bottom layer; its specific gravity therefore lies between 0·99 and 1·638. By a series of experiments it was found that the virus floats in a suspending fluid of sp. gr. 1·14 and sinks in one of sp. gr. 1·11; its own specific gravity therefore is probably about 1·12 or 1·13.

When the virus is washed and centrifugated in a suspending fluid just heavier than itself, in the resulting (virulent) top-layer the granules will be disclosed by dark-field illumination. They shine dully, and show movement probably Brownian. They occur singly, or in small groups, or sometimes in tiny beaded chains. They can be seen under an ordinary microscope, and, when clumped, with a low power. They stain faintly with Löffler's blue, show blue or red with Wright's stain, and take a fairly deep stain with carbol fuchsin; they are Gram-negative, and they do not stain with neutral red or trypan blue. The authors have not got them to agglutinate, nor as yet have they attempted culture.

What the authors wish to emphasize is the method of differential centrifugation with the use of suspending fluids of different specific gravities—a method full of widely suggestive applications.

A. A.

REYNÈS. **Les greffes sur les noirs.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus.* pp. 235–236.

On three Senegalese with large ulcers on the legs and feet the author practised grafting with strips obtained from the thigh. They took well but grew white, losing all their pigmentation. The decoloration is explained by the process of vitalization of the graft—new vascular connexions, action of leucocytes, etc. The author does not know whether pigment appeared later.

A. G. B.

i. MATIGNON (J. J.). **Les stations thermales françaises pour coloniaux.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus.* pp. 316–328.

ii. ROUZAUD, BISCONS & DE FOSSEY (Mathieu). **Vichy et les Coloniaux. (Indications et contre indications).**—*Ibid.* pp. 329–334.

i. The properties of five French spas are here described with much detail:—(1) Châtel-Guyon, to which the author is attached, (2) Plombières, (3) Brides-les-Bains, (4) La Bourboule, (5) Royat. The author classifies the states for which tropical residents are invalided, as gastro-intestinal (parasitic or toxi-alimentary), hepatic (malarial or toxi-intestinal), and blood states (various forms of anaemia), with reservations as to the sharpness of these distinctions. For affections of the digestive tube (1), (2) and (3) are advised; for liver cases, Vichy and (4); for anaemia, (4); for recruitment of health, (5). La Bourboule water is rich in arsenic. For details of the waters, their uses, and the states which benefit in each case the paper must be consulted.

ii. Similar details are given for Vichy.

A. G. B.

VERVOORT (H.). **Verslag van het pathologisch laboratorium Medan-Deli (Sumatra's oostkust) over 1907-1921.** [Report on the Pathological Laboratory at Medan (Province of Deli, Government of Sumatra's East-coast) from 1907 to 1921.]—60 pp. With 1 map & 7 figs. [57 refs.] 1922. Medan: Typ. Köhler & Co.

This laboratory, founded in 1907 by three tobacco-growing companies, to provide for themselves a central institute for investigations that cannot be carried out at the ordinary hospital laboratories, quickly became a research-centre for the whole of Deli and its adjoining provinces under the able directorship of Dr. W. A. KUENEN and his temporary or permanent successors, VAN LOGHEM, VERVOORT and SNIJDERS. In 1920 the institute came into the joint possession of the Deli Planters' Association and the Union of Rubbergrowers on Sumatra's East-coast.

Apart from a list of the directors, assistants, workers and visitors, the report gives a summary (pp. 10–50) of (1) Clinical bacteriological examinations carried out in this period, with some details of the bacteriological diagnosis of cholera, pseudocholera, typhoid and allied diseases, amoebic and bacillary dysentery, plague, etc.; (2) Clinical microscopical examinations (malaria, filariasis, etc.); (3) Bacteriological and chemical surveys of existing or projected local water supplies; (4) Veterinary examinations (rabies, surra, anthrax, etc.); (5) Preparation of diagnostic sera; 22 kinds are in use but only typhoid-paratyphoid serum is prepared on a large scale for export (16,925 cc. in 1921 with 18,160 cc. emulsion for Widal-test); (6) Chemical examinations (notably on the quality of rice); (7) Wassermann-tests, the technique used being described in detail (55,854 examinations since 1912).

On pp. 50–55 are some details of the preparation and distribution of vaccine lymph (33,049 doses in 1921); polyvalent vaccines against cholera (30,270); typhoid (38,175); combined cholera-typhoid (6,481); cholera-typhoid-paratyphoid A (2,225); typhoid-paratyphoid A (19,500); staphylococci (3,090); gonococci (3,960); meningococci (705 doses in 1920); various autovaccines in smaller quantities; therapeutic or prophylactic sera against Shiga-dysentery (17,610 cc. in 1921) and epidemic meningitis (8,600).

A record of post-mortem examinations and of original researches, together with a list of publications referring to the latter, is appended.

N. H. Swellengrebel

LE DANTEC. **L'Institut d'Hygiène Sociale de Dakar.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus.* pp. 398–403.

The Institute of Social Hygiene at Dakar comprises dispensaries for general diseases, tuberculosis, venereal diseases, special subjects (eyes, ears, etc.), skin diseases, gynaecology, each with its own Medical Director, and prenatal and babies' departments presided over by midwives—all European personnel. Some of these had precursors—in 1921 there were no fewer than 10,000 women patients—but the opening of the Institute took place in June, 1922. The success may be gauged by the fact that in July 1,522 persons came for advice. Adequate records are filed. There are four nurse visitors who attend the women's departments in the morning and go their rounds afterwards. [See also this *Bulletin*, Vol. 17, p. 218.]

A. G. B.

VALENZUELA (A. J.). **[Breve resumen sobre la patología médica ecuatoriana y su distribución geográfica.]**—*Anales de la Soc. Méd.-Quirúrgica del Guayas.* 1922. No. 14. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 3. pp. 109–110.]

From the German summary the following is gleaned :—

Diseases found in Ecuador are: tuberculosis, syphilis, leprosy, smallpox, measles, malaria (68 per cent. of hospital admissions), typhoid, bacillary and amoebic dysentery, gonorrhoea, influenza, yaws, plague (Guayaquil), cerebrospinal meningitis, trachoma, anthrax, pneumonia (especially in the mountains), sprue, pellagra, beriberi. The usual intestinal parasites are found. Filaria has not yet been microscopically demonstrated. Scarlet fever is sporadic, blackwater fever rare. Cholera, typhus and undulant fever have not been reported, rabies only once. Diphtheria is sporadic and mild. Kala azar has not yet been diagnosed but dermal leishmaniasis is widespread.

A. G. B.

DUBOIS (A.). **Syphilides secondaires localisées aux tatouages.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. p. 153. With 1 plate.

A woman in whom a chancre was diagnosed returned later with a papulo-squamous eruption limited to old tattoo marks on the arms, abdomen and hips. Each little keloid was surrounded by a syphilide and there were no lesions elsewhere.

A. G. B.

LOUGHNAN (W. F. M.). **Notes on Alastrim in Jamaica.**—*Jl. Roy. Army Med. Corps.* 1922. Nov. Vol. 39. No. 5. pp. 378–381. [6 refs.]

An account of the history, etiology, method of spread, and symptoms of alastrim, as seen in Jamaica. It does not seem to add anything of importance to the accounts noticed in this *Bulletin* (Vol. 19, p. 438). A table of the differential diagnosis of smallpox, alastrim and varicella is given from COPEMAN.

A. G. B.

MOFFAT (R. U.). **Amaas or Alastrim.** [Correspondence.]—*Brit. Med. Jl.* 1922. Aug. 12. p. 283.

The writer, in opposition to DE KORTE, maintains his belief that " amaas " and " alastrim " are synonyms of smallpox. He thinks that the assertion that amaas has been endemic under that name for centuries overlooks the fact that our knowledge of South Africa beyond the boundaries of Cape Colony, and of South African diseases, is comparatively recent. He attributes the origin of the term " Kaffir pox " and of the reputed immunity of Europeans, to a well-meant attempt, during the Kimberley epidemic of 1881, to avert a scare among Europeans. He admits that Europeans do not usually contract smallpox from South African natives, but only because Europeans are usually protected by vaccination.

A. A.

i. DE KORTE (W. E.). **Small-Pox and Amaas.** [Correspondence.]—*Lancet.* 1923. Jan. 13. p. 101.
ii. ROBERTSON (Wm.). **Small-Pox and Amaas in South Africa.** [Correspondence.]—*Ibid.* Jan. 27. p. 205.
iii. WALKER (P. H.). **Small-Pox and Amaas.** [Correspondence.]—*Ibid.* Mar. 17. p. 564.

Three letters from South Africa:—

i. In the present state of knowledge, that is with the etiological agent unknown, no one can affirm what is the relationship between smallpox and amaas. The death-rate of amaas is low and Jennerian vaccination is preventive. It is still, however, uncertain whether amaas breeds true to type, though it seems to do so. As long as the identity is uncertain, the name amaas should be kept up. The author's own view is that it is mitigated smallpox.

ii. Memories of the Kimberley smallpox outbreak of 1882, which the author stamped out by vaccination.

iii. Walker thinks that the relation of amaas to smallpox is that ot scarlatina to scarlet fever, and believes that " it only requires passage through a sufficient number of adults to convert what is now a child's mild disease into the terror of pre-vaccination times."

A. G. B.

HOFFMANN (W. H.). **Das Blutbild als klinisches Untersuchungsmittel.**—*Deut. Med. Woch.* 1922. Vol. 48. No. 27. pp. 903-904.

A discussion on the time necessary for making a reliable differential count of 100-200 leucocytes. SCHILLING and his colleagues allow 5 to 10 minutes; Hoffmann, after 20 years' experience in the tropics, maintains that it cannot be done in less than 10 to 20 minutes and sometimes may require 30 to 50 minutes.

A. A.

ATMOSOEDIRO (Mas Iskandar). **The Bilirubin-Content of the Blood.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 280-293.

The author has investigated by MEULENGRACHT'S colour-reaction test the bilirubin content of the blood in Weltevreden—in normal persons, in whom it does not differ from the European standard, and in various diseases. He finds that the determination of the bilirubin content is of practical clinical value in the following cases: (*a*) when the amount of bilirubin in the blood rises during or shortly after attacks of pain suggesting biliary colic, gallstone or, rather, disturbance in the excretion of bile is indicated; (*b*) in icteric cases a fall from 50 to 30 is a good prognostic; (*c*) in secondary anaemia—the amount of bilirubin is always low; (*d*) in the early stages of broken compensation of the heart the amount of bilirubin is always raised; (*e*) in differential diagnosis in fevers a raised bilirubin figure points to pneumonia.

A. A.

DJAMIL (Moh.). **The Secretion of Chlorine in Febrile Diseases.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 226-235. With 12 charts. [10 refs.]

The author has investigated the secretion of chlorine in different febrile diseases in Weltevreden—malaria, pneumonia, typhoid, epidemic meningitis, van der Scheer's fever, and dysenteries—also in oedema, and he finds no great differences from observations made in Europe, except in the case of malaria. In Europe an increased secretion of chlorine, in the tropics a reduced secretion, has been observed during malarial fever, but the author thinks that this difference is attributable to the period of observation and the amount of material examined.

A. A.

KORTHOFF (G.). **Investigation into the Relation of the Four Groups for Bloodtransfusion in the Dutch East Indies.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 193–199.

The author sketches the history of transfusion of blood up to Moss, who in 1910 in his " Studies on iso-agglutinins and iso-haemolysins " formulated the inter-relations of human bloods within four distinct groups. For practical purposes of transfusion the author has studied European and Native bloods in Java. He finds that they can be classified, according to the Moss formula, in four groups having the same inter-relations as in Europe and America, but that within each specific group slight variations in the degree of agglutination and haemolysis exist. He recommends that the examination of individuals for suitability of transfusion should be made microscopically, with not too small quantities of blood ; and he considers that very slight degrees of agglutination need not invalidate a donor.

A. A.

PEREIRA LAGE (Fausto). **Influencia da seca em Cabo Verde na patologia Indígena. Doenças por " carencia " (avitaminoses).** [Drought as a Disease Factor in Cabo Verde. Deficiency Diseases.]—*Rev. Méd. Angola.* 1922. Sept. No. 3. pp. 143–145.

The author records eight cases of beriberi and one of pellagra. These are attributed to a severe drought for two successive years which led to failure of vegetable crops and to deterioration of the cattle used for food, so that the inhabitants were forced to exist largely on maize, often of inferior quality. All the patients were children, only one being over seven years of age

H. Harold Scott.

HOOTON (A.). **Ether in the Tropics : A Further Note.**—*Indian Med. Gaz.* 1922. Dec. Vol. 57. No. 12. pp. 455–456.

The author described and recommended some months ago Dr. K. B. PINSON's ether vaporizing apparatus as particularly adapted for use in the tropics. PINSON has now employed it in about 5,000 cases [where, is not stated] with unqualified success. The consumption works out at 4–7 oz. per hour of maintenance, anaesthesia having been induced by other means. He agrees that cheap methylated ether is as good as " anaesthetic " ether and recommends both McFarlane's and Howards'.

A. G. B.

MÜLLER (Reiner). **Aloys Pollender 1800–1879.**—*Jahrbuch des Bergischen Geschichtsvereins.* Elberfeld. 1922. 9 pp.

Some particulars of the parentage and life of Dr. Aloys POLLENDER, who was the first to discover the organism subsequently classed as

Bacillus anthracis, in the blood of cows dead of splenic fever. POLLENDER's discovery was made in 1849, but was not disseminated until 1855, in Caspar's Vierteljahrschrift, VIII. POLLENDER discovered the organisms, described them, and recognized that they must belong to the vegetable kingdom ; but he did not investigate their significance —whether they were causative, or determinative, or merely concomitant in relation to the disease, though he understood that these questions required investigation.

[Textbooks of Pathology mention the name of POLLENDER and the date of his discovery of the organism ; but, unlike the present author, they do not attribute the discovery of pathogenic bacilli to POLLENDER.]

A. A.

MONTEIRO (J. Lemos). **Sobre o phenomeno de d'Herelle. Presença do principio lytico nas culturas em meio solido, do** *Bacillo anthracis, B. pestis* **e** *B. dys.* **Shiga-Kruse.**—*Brazil-Medico.* 1922. June 10. Year 36. Vol. 1. No. 23. pp. 297–301 ; and *Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. May & June. Vol. 5. 2nd Ser. Nos. 3 & 4. pp. 71–78.

A highly technical account given before the " Sociedade de Medicina e Cirurgia de S. Paulo " on June 1, 1922, of experiments on the subject of bacteriolysis occurring in gelatine cultures of the named micro-organisms. The author's conclusions are stated as follows :—

1. In old gelatine cultures (inclined) of *B. anthracis, B. pestis* and *B. dysenteriae* (Shiga-Kruse type) a bacteriolytic principle is met with capable of dissolving the respective bacilli.

2. This principle manifests its action in series. Its activity is, however, not very marked.

3. It is probable that its increase proceeds in definite proportion to its formation at the expense of the bacteria dissolved.

4. The bacteriolytic principle (lysin) secreted by the micro-organism in culture brings about the phenomenon of lysis in a manner different from that of the bacteriophage of d'Herelle.

5 The lysin secreted by bacilli, not in culture but in a resisting animal organism, is very much more active, its activity being not merely maintained but augmented in successive series in proportion to its formation at the expense of fresh bacteria dissolved.

F. S. Arnold.

DAY (H. B.). **A Note on the Effect of Bismuth on the Kidneys.**—*Lancet.* 1922. Aug. 12. pp. 328–329. With 2 charts in text.

Several observers have testified to the curative action of bismuth in spirochaetous diseases. It is also known that soluble compounds of bismuth are at least ten times more toxic when given by the intravenous than by the intramuscular method.

The author has experimented with intravenous injections of liquor bismuthi et ammonii citratis (B.P.) properly sterilized, and has observed that a large dose (2 cc.) provokes signs of poisoning—nausea or actual vomiting and slight diarrhoea and also a copious diuresis not accompanied by any signs of vesical irritation. In one case a single intravenous injection of 2 cc. was followed by an acute tubular nephritis.

To determine the possibility of a diuretic effect of the citrate component the same amount of citrate of potash was given intravenously to several patients; this had a distinct but far less diuretic effect.

A. A.

CRAMER (W.), DREW (A. H.) & MOTTRAM (J. C.). **On Blood-Platelets: their Behaviour in "Vitamin A" Deficiency and after "Radiation," and their Relation to Bacterial Infections.**—*Proc. Roy. Soc.* 1922. July 1. Vol. 93. Ser. B. No. B 655. Biol. Sci. pp. 449-467. With 5 text figs. [10 refs.]

"The absence of the fat soluble vitamin from the diet always leads in the rat to a progressive diminution in the number of blood platelets. This thrombopenia is the only constant lesion which we have found, so far, in every case of vitamin A deficiency, and we regard it as the lesion characteristic of this deficiency, just as the lymphopenia is characteristic of the vitamin B deficiency. A thrombopenia may even be found in rats kept on a vitamin A free diet when they do not yet show any obvious signs of ill-health, and are, to all external appearances, normal animals. When a profound thrombopenia has been established, the addition of the missing vitamin A to the diet is followed by a rapid increase in the number of platelets to the normal number, provided that the animal has not been allowed to suffer too long and too severely from the deficiency.

"Exposure to radium produces not only a lymphopenia, but also with sufficiently large doses a thrombopenia. From this the animals recover rapidly, if the application of radium is discontinued, and the dose has not been too large.

"If by exposure to radium, or by witholding the fat soluble vitamin, the number of platelets has been reduced below a certain critical level—about 300,000 for the rat—the resistance of the animal to infection is greatly diminished and infective conditions develop spontaneously. These may lead to a secondary anaemia. The infective conditions may clear up again as the number of platelets is made to increase.

"The blood platelets fulfil an important function in the mechanism of resistance to bacterial infection. Alterations in the local or general resistance to infection are associated with local or general changes in the distribution of the platelets."

A. G. B.

STEPHENS (J. W. W.). **The Incidence of a Disease in Population Groups, the Number of People in which is Known or Unknown.**—*Ann. Trop. Med. & Parasit.* 1922. July 20. Vol. 16. No. 2. pp. 199-205.

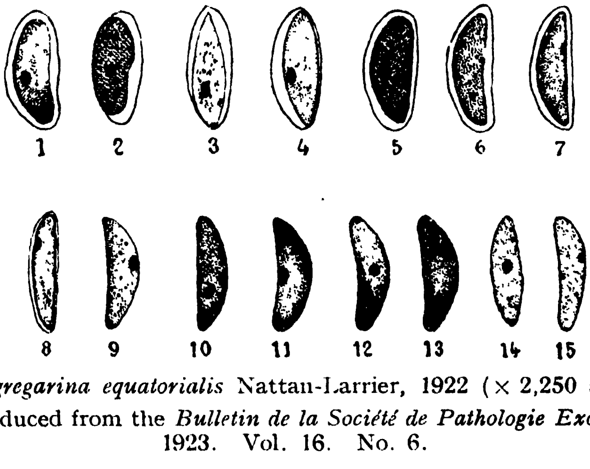
The word "incidence" is often used to express the occurrence or distribution of a phenomenon in a population whose number is unknown: in this use it is not a term of mathematical value. As a coin of definite value in statistical currency a term is required to express incidence or occurrences of a phenomenon in a population whose number is known. For incidence in this restricted sense, the author would employ the term "incidence-rate." The author gives numerous obvious examples of the distinction between "incidence" and "incidence-rate."

A. A.

" HAEMOGREGARINES " IN MAN.

ADDENDUM. By C. M. WENYON.

In a recent number of this *Bulletin* (Vol. 20, p. 527) there appeared a criticism by the reviewer of the claims made by various observers that certain bodies found by them in man were haemogregarines. One of these (*Haemogregarina equatorialis*) had been described by NATTAN-LARRIER* who now gives a more detailed account of the same organism. It was concluded in the critique that this, as well as the other " haemogregarines " of man, was not of this nature, and the further illustrated communication only serves to strengthen the opinion that the supposed haemogregarine of NATTAN-LARRIER is a vegetable organism which had contaminated the films. The parasite, which is described as extraglobular, was found in a single blood film and in a smear made from material obtained from puncture of a gland. The size is given as 5·5 to 7·5 by 1·6 to 2·6 microns. The lentil shape of the majority is again mentioned, as also the presence round some of a capsule. The nucleus is small and not infrequently lies at one side of the parasite. Occasionally two such nuclei occur. In addition to the nucleus the cytoplasm, which, after Giesma staining, varies in colour between a light mauve and deep blue, contains irregular granules of a deep blue or even blackish colour. Apart from the above forms, which occurred both in the blood and gland material, the latter contained numbers of still smaller elongated bodies from 2 to 3 microns in length. These are described in detail. It is remarked that it is difficult to avoid the conclusion that the small forms from the gland represent a stage of the haemogregarine of the blood, though it has to be recognized that the larger forms from the gland differ in certain respects from those of the blood. A comparison of the figures, which appeared in the abovementioned critique, of known vegetable organisms in contaminated films with those accompanying this paper, will certainly convince any unbiased observer that there is no evidence that *Haemogregarina equatorialis* is a haemogregarine at all, and that it is most probably a vegetable organism, a view which the reviewer is convinced is the correct one.



Haemogregarina equatorialis Nattan-Larrier, 1922 (× 2,250 about).
Reproduced from the *Bulletin de la Société de Pathologie Exotique*, 1923. Vol. 16. No. 6.

---

*NATTAN-LARRIER (L.). Sur une hémogrégarine de l'homme (Deuxième note.)—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 403–408. With 3 figs. [1 ref.]

REVIEWS AND NOTICES.

ROCKEFELLER FOUNDATION. **Review for 1922. A Summary for the First Decade.** By George E. VINCENT (President).—59 pp. With 28 figs. 1923. New York.

We learn from this munificent report that in the pursuit of its aim " to promote the well-being of mankind throughout the world," the Rockefeller Foundation has in its first decade disbursed the enormous sum of 76,757,040 dollars.

The main channels through which the Foundation hopes to influence and stimulate the human race for its material welfare are medical research and medical education (to which nearly one-third of the benefaction just mentioned has been contributed) and the world-wide diffusion of sanitary knowledge—ignorance being the common curse of governments no less than of subordinate humanity—by far-flung demonstrations of the methods and results of public sanitation.

In the year 1922, of which this report gives us some details, the Foundation, in the cause of education, endowed chairs of medicine and surgery in Hong Kong University; financed outright its dedicated child, the Peking Union Medical College; and assisted the educational and other machinery of 19 other hospitals in China; sent eminent medical men on educational missions to the Far East and to South America, and provided fellowships for 237 advanced students of 23 different nations; besides contributing to the maintenance of two medical schools in Canada; systematically surveying medical education and supplying the exigencies of various research institutions in Europe, and definitely pledging its financial countenance to medical colleges and schools in China, Siam and Brazil, as well as to big educational enterprises in London and in Iowa.

During 1922, in the cause of Public Health, the Foundation carried on antimalaria surveys in tropical America, Palestine, the Philippines and Australia, as well as surveys and demonstrations in the United States; continued its operations for the control of yellow fever in Mexico and other countries, and its surveys and re-surveys for the control of hookworm in the Southern States and in 21 areas under foreign jurisdiction; and contributed financially or in personnel to multifarious undertakings of an educative or an administrative character in Europe and in the United States.

The total expenditure on all the items recorded in the report for the year amounted very nearly to 16 million dollars, the costs of administration being only about one per cent.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 11.

MEDICAL HELMINTHOLOGY: A REVIEW—(PART I—*cont.**)

By R. T. LEIPER, M.D., D.SC., F.R.S.
Sectional Editor, Tropical Diseases Bureau.

PLATYHELMIA—TREMATODA (Hermaphroditic forms—*cont.*).

Gastrodiscoides hominis.

The systematic position of this parasite found first by LEWIS and McCONNELL in 1876 has been the subject of consideration by several workers. Placed in the genus "Amphistoma" by the discoverers, FISCHOEDER, in 1902, on account of the flattened ventral aspect transferred it to the genus *Gastrodiscus*, and in 1913 LEIPER made it the type species of a new genus named *Gastrodiscoides*. The validity of this separation of the species from other forms, *G. aegyptiacus* and *G. secundus*, met with in the horse in Africa and India respectively has been questioned by LANE (1922), but has been supported more recently by KHALIL (1923). It would appear that the parasite is fairly common in Assam and in Annam. BRAU and L. BRUYANT (1913) report its occurrence in 5 per cent. of the pigs in Cochin-China, and KHALIL (1923) has described a heavy infestation in a Napu mouse deer (*Tragulus napu*) from the Malay States. He is of opinion that the presence of the genital pore on the elongated cephalic portion of the body and the absence of "pseudo-suckers" from the ventral aspect of the discoidal portion of the body remain characters of generic significance which distinguish *Gastrodiscoides* from *Gastrodiscus*.

Watsonius watsoni.

Although this parasite is reported as common in Nigeria (MANSON, 1921), these reports are not based upon an actual examination of the specimens, and the first record of its presence in man made by CONYNGHAM in 1904 remains the only valid case in literature. The systematic position of the parasite has been discussed by STILES and GOLDBERGER (1910) who have made this species type of a new genus and have shown from a re-examination of the original specimens that the testes are tandem in position in the body. The reservoir host would appear to be *Cercopithecus callitrichus*, for RAILLIET, HENRY and JOYEUX have found specimens of the parasite in the caecum of this monkey in French Guinea.

---

* Continued from Vol. 19, pp. 361–365. For Part II (CESTODA) *see* Vol. 20, pp. 85–91.

KOBAYASHI (1920) now considers that the parasite from *Macacus cynomolgus* named by him in 1915 *Watsonius macaci* is probably identical with this species. Recently MAPLESTONE (1923) has drawn attention to the close similarity of the genera *Watsonius* and *Pseudodiscus,* and inclines to the opinion that *Watsonius watsoni* is identical with *Pseudodiscus hawkesii,* a parasite hitherto known only in Indian elephants.

PLATYHELMIA—TREMATODA (Unisexual forms).

Schistosomidae.

Amongst the Platyhelmia the occurrence of unisexual and dimorphic forms is of great rarity, being found in only two or three small genera, one of which, however, named *Schistosoma* or *Bilharzia,* has attracted much attention on account of its medical and economic importance as well as the special problems and theories associated with its transmission.

Prior to the work of Looss (1899) which resulted in the classification of the Distomes upon their internal characters, the Bilharzia worms were thought to form a peculiar and isolated group, but further studies, notably those by ODHNER (1912), have revealed the course of phyletic development of these unisexual blood worms from a hermaphroditic intestinal parasite, resembling the genus *Liolope,* and proceeding through various successive stages of specialization as seen in the genera *Hapalotrema, Bilharziella, Ornithobilharzia* to *Schistosoma.*

In the genus *Schistosoma,* seven species are now known. Two of these, viz., *S. haematobium* and *S. mansoni,* occur in man alone as natural infections, while two, viz., *S. japonicum* and *S. bovis,* occur in domesticated animals as well as in man in the same endemic areas. The other species *S. bomfordi, S. indicum, S. spindalis* (MONTGOMERY, 1906) occur in domesticated animals, *e.g.,* horse, sheep, cattle, etc., and it is not at all improbable that they may, like *S. bovis,* occasionally invade man as incidental infections. Such infections may provide an explanation for the sporadic occurrence of cases of bilharziasis in India. These cases have hitherto been diagnosed solely upon the eggs found in the urine and it is noteworthy that there is a very close resemblance between the eggs of *S. indicum* and those of *S. haematobium.* In this connexion reference may be made to the elaborate studies upon the cercariae which occur in Indian molluscs by SEWELL in 1922.

Differentiation of Species.

S. haematobium was discovered by BILHARZ (1852) and its anatomy had been worked out by Looss (1895). In this description, however, there is some confusion with *S. mansoni* which Looss had not recognised as a distinct species. *S. japonicum* was first found by KATSURADA, and described by him in detail in 1904. *S. mansoni* was named in 1907 by SAMBON on the peculiar shape of the egg and geographical range. Its anatomy was described by HOLCOMB (1907) and DA SILVA (1908), but the differential characters were not definitely determined until 1916 (LEIPER). *S. bovis* was discovered by SONSINO in cattle and sheep in Egypt, and later in Sicily, Sardinia and Nyasaland. It was not considered to be a parasite of man until CAWSTON (1921) recorded a case of vesical infection in Natal, in which, along with typical eggs of *S. haematobium* there occurred the elongate spindle-shaped eggs which appear to be peculiar to *S. bovis.* The presence of intermediate shapes in the same patient renders the case of doubtful validity. Support of the view that *S. bovis* is actually an occasional parasite of man may be forthcoming from the Congo where REYNAUD and LEGER (1922) and others have recently found cases of rectal bilharziasis without cystic involvement due to eggs tending towards the shape of those of *S. bovis*. In anatomy *S. bovis* closely resembles *S. haematobium*, but no morphological details have yet been published.

S. japonicum.

Various earlier Japanese observers had succeeded in obtaining experimental infections of domesticated animals—cats, dogs, cattle, etc., by immersing them for periods in the waters covering the flooded rice fields, but in 1912 MIYAGAWA described in the *Centralblatt f. Bakt.*, the morphology of the young worms at the time of skin invasion, and their passage into the blood, and to a less extent the lymphatics. The invasion forms were described as possessing an oral and a ventral sucker, and as being covered with cilia. These invasion bodies were seen to differ in essential characters from miracidia and, having characteristics of cercaria, an intermediate host was hypothecated. In September 1913, MIYAIRI and SUZUKI announced in the *Tokyo iji-shinshi* the experimental invasion with miracidia of a dark coloured snail with seven spirals collected from the ditches of an infected locality in the island of Kuysuhu. Twelve days after infection rediae and secondary rediae concentrated in the hepatic ducts of the snails. Mice were placed in the vessel in which the full grown snails were fed, and after three weeks numerous schistosomes were found in their livers. During the summer of 1914, LEIPER [see LEIPER and ATKINSON (1915)] working in Katayama on the Japanese mainland, confirmed MIYAIRI and SUZUKI by infecting white mice with cercariae from naturally infected specimens of *Blanfordia nosophora*. These cercariae were found to develop constantly in thin-walled sporocysts, not in rediae. At first it appeared possible that the experimentally infected snails used by MIYAIRI and SUZUKI were naturally infected with another form, but the fuller publication of the results of these workers [MIYAIRI and SUZUKI (1914)] showed that the stages they had interpreted as rediae were really sporocysts. The morphology of the miracidium and its external covering was elucidated by MIYAIRI and SUZUKI (1914) and CORT (1919), and in the same year OGATA (1914) published an account of the cercaria of which a more detailed study has been made recently by CORT (1920). The intermediate host first named *Katayama nosophora* by ROBSON (1915) was referred to the genus *Blanfordia* by PILSBRY, and to *Hemibia* by ANNANDALE. Still more recently it has been recognized as synonymous with *Hemibia japonica*. In 1922 SUYEMORI found that *Blanfordia formosana* acted as the intermediate host of *S. japonicum* in Formosa and during the present year MELENEY and FAUST have shown *Hemibia hupensis* to be the carrier in the Yangtse Valley.

The migration of the parasite after its entry through the skin has been studied in detail by NARABAYASHI (1916) who believes that the young forms having reached the lung, burrow through the tissue into the mediastinum and so reach the portal system by piercing the surface of the liver, while MIYAGAWA and TAKEMOTO (1921) hold that these are aberrant forms and that those which succeed in reaching the portal system are forms which have remained in the capillaries of the lung and so gained the systemic circulation, in which certain of them reach the capillary network of the gut wall which they also traverse, thus reaching the liver from the finer branches of the portal vein. SUYEYASU (1920) supports NARABAYASHI, believing that the young worms after leaving the lung can pierce the diaphragm at any point and so reach the liver.

Prophylactic measures in Japan are based upon the knowledge that *Hemibia japonica* is the only intermediate host, that it is provided with an operculum whereby it can close its shell and can resist drying, but is markedly susceptible to lime (NARABAYASHI, 1916). The snail inhabits the ditches of the rice-growing regions to a much greater extent than the rice fields. The known geographical range of the disease in Japan is closely related to the distribution of the rice-growing areas.

In endemic regions the incidence of urticaria and of fever following upon immersions in shallow pools and marshy areas became associated with *S. japonicum* in the minds of physicians before the mode of infection of this parasite was understood. To Dr. HOUGHTON belongs the credit of definitely associating the two conditions (LOGAN, 1912). Under the term Yangtse fever clinical studies were published by EDGAR in 1912. The condition known as " Kabure," an inflammation of the skin, was held by TSUCHIYA (1913) not to be directly associated with the entrance lesion of the schistosome parasite. TSUCHIYA noted, however, that during the initial symptoms of *S. japonicum* infection there was a rise of temperature and symptoms resembling typhoid or paratyphoid, and that during the course of the disease there was a marked enlargement and tenderness of the liver and increase in the size of the spleen. NARABAYASHI (1916) takes the opposite view that there is a definite relationship between schistosomiasis and Kabure.

LANING (1914) recognised three stages in the onset of Schistosomiasis as a result of a study of cases among American sailors stationed on the Yangtse.—The onset with high temperature, high eosinophilia and evanescent oedema, urticaria, with pains in the abdomen; the development later of an enlarged spleen with the passage of blood-stained mucus containing eggs of the parasite and the supervention three or five years later of a cirrhotic liver, ascites, oedematous extremities and marked emaciation; the passage of blood and mucus in the stools with little fever. CHASTANG (1914) and BOVAIRD and CECIL (1914) deal also with these symptoms. An early study of the blood, with its high eosinophilia in these cases, had been made by BASSETT-SMITH in 1912.

FUJINAMI and SUEYASU (1917–1918) have shown that naturally immune animals and even plants are entered by the cercaria of *S. japonicum,* but in non-susceptible animals become surrounded by giant cells of the " foreign body " type and eventually disappear.

In the treatment of *S. japonicum,* earlier workers had relied with little success upon quinine. In 1913 HUTCHESON published results on the treatment of thirteen cases of dysentery with emetine. Antimony introduced by CHRISTOPHERSON in 1916 [*see* CHRISTOPHERSON, 1918, 1919] was used successfully by CAWSTON and by LIBBY (1923) in cases of *S. japonicum.* The diagnostic method introduced by FAIRLEY (1919) for detecting schistosome infections by using as an antigen an extract of the liver of an infected snail has been shown to be effective in *S. japonicum* with antigen prepared from *S. haematobium* cercaria in *Physopsis africana.*

S. mansoni.

This species, created by SAMBON in 1907, was the subject of considerable controversy (LOOSS 1911—SAMBON) and its separation a matter of individual predilection until 1915 when LEIPER described the chief morphological characters in which it differs from *S. haematobium*, the differentiation being made from specimens of both species reared in experimentally infected animals. LEIPER (1915) showed that this species in Egypt is transmitted by *Planorbis boissyi*. LUTZ, working in Brazil, implicated *Planorbis olivaceus* as a carrier and showed that in *P. ferrugineus* and *P. tenagrophilus* infection did not mature (1916, 1917). The full account of LUTZ's observations appeared in 1919. In Venezuela the question of the carrier was studied by ITURBE and GONZALEZ (1917). These authors implicated *P. guadeloupensis* as the true intermediary in Caracas and described and figured a redia in the developmental cycle, stating that their observations corroborated the evolutionary stages described by MIYAIRI and SUZUKI for *S. japonicum*. Their illustrations, however, do not support this conclusion, and an examination later by FAUST (1918) of the original material showed that the schistosome redia was an encysted Tetracotyle. The cercaria of *S. mansoni* in Venezuela was described by ITURBE in 1917, and in detail by KHALIL (1922). LEIPER, LEE and KHALIL showed that *P. olivaceus* occurred naturally infected in Paramaribo, Dutch Guiana, in 1921. *P. guadeloupensis* has a distribution corresponding to that of the disease in the West Indies and is the probable carrier in these Islands. At one time much was made of the fact that the eggs of *S. mansoni* occurred only in the faeces. The intestine wall would appear to be the natural habitat of the parasite, but occasionally there is a slight invasion of the bladder wall, and a few eggs occur in the urine. Several such cases have been recorded (MACFIE, 1920).

Following LETULLE (1905) the pathology of *S. mansoni* infection has been described by DARLING (1913 and 1918), AMEUILLE and MAGNE (1918) from Martiniquan cases, by RISQUEZ (1916, 1919) from Venezuela and GONZALEZ (1916), who first brought evidence of the prevalence of intestinal schistosomiasis in Porto Rico, has given a clinical picture based upon the study of 356 cases. GIRARD (1920) recorded for the first time the presence of this species in Madagascar and its sporadic occurrence in Natal has been noted by CAWSTON (1921).

As in the cases of *S. japonicum*, there are early symptoms, abdominal pain, enlarged and tender liver and spleen, pyrexia, bronchitis, urticaria and diarrhoea. These have been fully studied by LAWTON (1917, 1918).

S. haematobium.

The anatomy of *S. haematobium* has been the subject of a monograph by LOOSS (1899) but the specific characters, especially those relating to the testes and gut, included characters later proved to be specific to *S. mansoni* (LEIPER, 1916). In 1915 the life history of the parasite was shown by LEIPER to take place in species of the genus *Bullinus*, *B. dybowski*, *B. contortus* and *B. innesi* in Egypt, and in *Physopsis africana* in the Transvaal by BECKER (1916). CAWSTON had previous to BECKER published a note implicating *P. africana*, but it is evident from his illustrations that the cercaria and sporocysts first found by him in this host belonged to a totally different species and was probably not a schistosome cercaria at all. During the early years succeeding the discovery of the Bilharzia development the term schistosome cercaria was applied very loosely and erroneously to all cercariae having bifid tails, and many of the statistical records of the occurrence of " Schistosome cercariae " in molluscs are on this account valueless. Later CAWSTON succeeded in identifying the true bilharzia cercaria and in innumerable papers located the carriers in various parts of South and East Africa. Dr. Annie PORTER (1920) found the cercariae in *Limnea natalensis,* but this would not appear to be of frequent occurrence, for the species also occurs in Egypt and has not been implicated either there or in South Africa by other workers.

The bionomics of *S. haematobium* cercariae and of its carrier have been studied in detail in Egypt by LEIPER (1915–6–8) and later by FAIRLEY and MANSON-BAHR. Preventive measures introduced during the war were based upon the short life of the cercaria after it had left the intermediate host. Suggestions for eradication of the infection by the extinction of the intermediate hosts fall into three categories—(1) LEIPER (1915) believes that in Egypt the disease could be controlled by utilizing the summer rotations in irrigation, which would result in the killing off of the Bullinus in vast numbers, as these snails are very susceptible to drying. (2) Various observers, first KEATINGE and later CAWSTON, ELGOOD and CHERRY (1919) have urged the utilization of flocks of domesticated ducks to eat up the snails. CAWSTON has made successful experiments in this line on a small scale in South Africa. (3) The destruction of the snails by chemicals has been advocated by LEIPER (1915), by Asa CHANDLER (1919), and by KHALIL (1922). The efficacy of copper sulphate, which is lethal in the dilution of 1 in 1,000,000, first introduced by CHANDLER, opens up a promising line of prophylaxis (KHALIL). The eradication of the disease, however, may be approached from another angle, for CHRISTOPHERSON, who brought into active use the intravenous treatment of schistosomiasis by antimony compounds, specially tartar emetic and colloidal antimony, has shown that antimony treatment results in the early death of the miracidia within the egg-shell so that a short time after the commencement of the treatment the patient, although still passing eggs in reduced numbers, has ceased to be a source of danger to others (CHRISTOPHERSON, 1919).

During the war there was much concern lest this disease should be introduced into countries hitherto uninfected, and the origin of an outbreak of schistosomiasis at Gaza was traced to the introduction of infected troops from Egypt. In Mesopotamia small outbreaks occurred, but 30 per cent. of inhabitants of some of the villages on the banks of the Tigris were known to be infected. The molluscan carrier in Mesopotamia has not been ascertained. *Bullinus contortus* occurs in the regions, but was seldom found alive. In India, sporadic cases of infection with *S. haematobium* led to a wide Zoological Survey during which it was proved that the molluscan genus *Bullinus* was not endemic in India. There seemed little likelihood of a widespread outbreak of schistosomiasis but several cases occurred in the neighbourhood of Hyderabad after the return of infected troops from Egypt. The probable source of these infections was revealed recently as a result of an enquiry by BETTENCOURT and BORGES into the occurrence of vesical schistosomiasis in Tavira in Portugal. It has been shown by these and other investigators that *Planorbis dufourii* is an efficient intermediary for *S. haematobium.* It would therefore appear probable that in India one of the local species of Planorbis has been a source of infection.

In the treatment of schistosomiasis two drugs have been found of immense value during the past few years. MacDonagh had treated successfully with tartar emetic a few cases during the Boer War, but had not published his conclusions until 1915 and then in a form which attached little importance to the discovery. In 1917, Christopherson, working in Khartoum, placed the treatment upon a firm and scientific footing, and many later workers have confirmed the claim that in antimony we have a certain cure for schistosomiasis. That the drug is given intravenously and over a period of days makes it a difficult method where the patient is merely a carrier, but a campaign combining curative treatment with molluscan eradication should prove effective in eliminating the disease in the endemic areas. The efficacy of emetine in schistosomiasis appears to have been noted first by Hutcheson in cases of *S. japonicum* (1913), but its use in *S. haematobium* infections has been urged by Mayer (1918), Diamantis (1917), Bonne (1919), and Erian (1919).

The clinical aspects of *S. haematobium* infections have formed the subject of excellent monographs by Madden (1907 & 1919), and the pathology has been the subject of new observations by Ferguson (1917) and others. Fairley's studies on the experimental pathology of *S. haematobium* and *S. mansoni* infections and the correlation of these with the pathological conditions seen in man is a masterly piece of work while his elaboration of a Bordet-Gengou reaction by which infections can be detected deserves special notice (1919). The recent advances on the clinical and pathological aspect of the subject have been fully dealt with in Byam and Archibald (1923).

REFERENCES.*

Gastrodiscoides hominis.

Brau & Bruyant (1913), *Bull. Soc. Path. Exot.*, *vi*, 41–43.

Fischoeder (1902). Die Paramphistomiden der Säugetiere. Diss. Königsberg. 59 pp., 4 figs., *and Zool. Anz.* [1901.] 374.

Khalil (1923), *Proc. Roy. Soc. Med.* Sect. Trop. Dis. and Parasit, xvi, 8–14.

Lane (1922), *Trans. Roy. Soc. Trop. Med. & Hyg.*, xvi, 22.

Leiper (1913), ii, 626.

Lewis & McConnell (1876), *Proc. Asiatic Soc. Bengal*, Aug., 182–186.

Watsonius watsoni.

Conyngham (1904), *Brit. Med. Jl.*, Sept. 17, p. 663.

Kobayashi (1920), *Parasitology*, xii, 392.

Manson's Tropical Diseases. Seventh Edition. (1921), 803.

Maplestone (1923), *Ann. Trop. Med. & Parasit.*, xvii, 164–165.

Railliet, Henry & Joyeux (1912), i, 442.

Stiles & Goldberger (1910), *Bull.* No. 60, *Hyg. Lab., U.S. Pub. Health & Mar. Hosp. Serv., Washington*, 259 pp.

Schistosomidae.

Bilharz (1852), *Ztschr. f. wissensch. Zool.*, Leipzig, iv, 72–76, 454–456.

Cawston (1921), xix, 204.

Holcomb (1907), *U.S. Naval Med. Bull.*, i, 55–80.

Katsurada (1904), *Annot. Zool. japon*, Tokyo, v, 147–160.

Looss (1895), *Arch. f. mikr. Anat.* Bonn., xlvi, 1–108.

—— (1899), *Zool. Jahrb.* Jena. Abt. f. syst., xii, (5–6), 521–784.

Montgomery (1906), *Jl. Trop. Vet. Sci.*, i, 15–46, 138–174.

Odhner (1912) ii, 180,

Reynaud & Leger (1922), xx, 619.

Sambon (1907), *Jl. Trop. Med. & Hyg.*, x, 117.

Sewell (1922), *Indian Jl. of Med. Research*, x, Suppl. No.

da Silva (1908) (1909), *Arch. de parasit*, xiii, 283.

Sonsino (1876), *Rendic. r. Accad. d. sc. fis. e mat.* Naples, xv, 84–87.

---

*References are to summaries in the *Tropical Diseases Bulletin* unless otherwise stated. Dates in parentheses refer to year of publication of original papers.

REFERENCES—*cont.*

Schistosoma japonicum.

Bassett-Smith (1912), i, 695.

Bovaird & Cecil (1914), iv, 519.

Chastang (1914), iv, 99.

Christopherson (J. B.) (1918), xiii, 206 ; (1919), xiv, 144 ; xvi, 138.

Cort (W. W.) (1919), xviii, 106.

Edgar (1912), ii, 178 ; (1913), ii, 631.

Fujinami & Sueyasu (1917), xii, 170 ; (1918), xvii, 60.

Hutcheson (1913), ii, 392.

Laning (1914), ix, 266.

Leiper (1915), vi, 437, vii, 345, viii, 509 (1918), xii, 164.

—— & Atkinson (1915), vi, 296.

Libby (1923), xx, 623.

Logan (1912), i, 105.

Meleney & Faust (1923), xx, 623.

Miyagawa (1912) (1913), ii, 405.

Miyagawa & Takemoto (1921), xix, 202.

Miyairi & Suzuki (1913), iii, 289 ; (1914), viii, 506.

Narabayashi (1916), x, 113.

Ogata (1914), ix, 269.

Robson (1915), vi, 296.

Sueyasu (1920), xviii, 107.

Suyemori (1923), xx, 221.

Tsuchiya (1913), ii, 406.

Schistosoma mansoni.

Ameuille & Magne (1918), xiii, 203.

Cawston (1921). xix, 204.

Darling (1912–13), vi, 299 (1918).

Faust (1918), xiii, 201.

Girard (1918), xii, 171.

Gonzalez (1916), ix, 269.

Iturbe (1917), x, 114 ; xi, 79.

—— & Gonzalez (1917), x, 114.

Khalil (1922), xix, 213, 649.

Lawton (1917), xii, 170 ; (1918), xiii, 204.

Leiper (1915), vi, 441.

Letulle (1904), *C. R. Soc. Biol.*, lvi, 607–609.

Looss (1911), *Jl. Trop. Med. & Hyg.* xiv, 177–182.

Lutz (1916), ix, 271 ; (1917), xi, 78 ; 1919, xvi, 136.

Macfie (1920), xvii, 59.

Risquez (1916), viii, 190 ; ix, 270 ; (1919), xix, 202 ; (1921), xix, 201.

Sambon (1907), *Jl. Trop. Med. & Hyg.* x, 117.

Schistosoma haematobium.

Becker (J. G.) (1916), viii, 188 ; x, 111.

Bonne (C.) (1919), xvii, 64.

Borges (1921), xix, 647.

Bettencourt & Borges, xix, 645.

Byam & Archibald, Edited by (1923). "The Practice of Medicine in the Tropics by Many Authorities." iii.

Cawston (1916), vii, 348–9; viii, 186–8; (1918), xi, 80–1; (1919), xiii, 198–9, 209; (1921), xvii, 37; xviii, 108, 111; (1922), xix, 204.

Chandler (1920), xix, 209.

Christopherson (1919).

Diamantis (1917), xi, 78 ; xi, 81.

Elgood & Cherry (1919), xv, 218.

Erian (1919), xv, 220.

Fairley (1919), xiv, 140 ; xv, 217 ; xvii, 52.

Ferguson (1917), xi, 76.

Leiper (1915), vii, 345.

Looss (1899), *Zool. Jahrb.* xii, (Syst.) 521–784.

McDonagh (1915). Biology and Treatment of Venereal Disease.

Madden (1907) "Bilharziosis."—London: Cassell & Co., Ltd.

(1919), "Surgery of Egypt."—Cairo: Nile Mission Press.

Manson-Bahr & Fairley (1920), xvi, 131.

Mayer (1918).

Porter (1920), xvi, 131.

KALA AZAR.

PRICE (J. Dodds). **Thirty Years' Experience of Kala-Azar in the Nowgong District of Assam.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 296–299.

In a previous paper published in 1914 [this *Bulletin*, Vol. 3, p. 552] the author and ROGERS described the methods of segregation which had been uniformly successful in eradicating kala azar from the tea gardens in Nowgong. In 1916 it became evident that kala azar was again assuming epidemic form. An inspection revealed the fact that the disease was very prevalent indeed, and in 1921, on returning from leave, the author found that kala azar was again present in the estates. Since then it has spread till hardly an estate is free. The coolies who become infected are the older residents, many of whom were born during the epidemic of 1897–1902. Though the antimony treatment has done much to alleviate the sufferings and relieve the financial burden, relapses after apparent cure are by no means uncommon. Formerly each death from kala azar represented a loss of 200 rupees, while now to effect a cure entails an expenditure of but 7 or 8 rupees. This is attained in about 75 per cent. of cases and one is forced to admit a vast improvement from both the economic and health point of view. Nevertheless, there is still complete ignorance of the method of transmission of the disease and its incubation period, and until these questions are satisfactorily answered no efforts based on the present lines of control must be relaxed.

C. M. Wenyon.

NAPIER (L. E.). **The Incidence of Kala-Azar in Bengal.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 299–301. [2 refs.]

An official survey carried out by the Public Health Department of Bengal resulted in a statement that there existed about 50,000 cases of kala azar in the whole of Bengal, with an annual death-rate of 10,000. From his experience at Calcutta since the treatment centre has been started, and from the figures obtained by Dr. BHATTACHARJI, who instituted a similar treatment centre at some 22 miles distance from Calcutta, it is evident that these figures under-estimate the true state of affairs. The author is convinced that the total number of cases in Bengal amongst a population of 46 millions must be between 1,518,000 and 2,668,000.

C. M. W.

i. CUNNINGHAM (J.) & VARADARAJAN (P. S.). **An Epidemiological Study of 663 Cases of Kala-Azar admitted to the Madras City Hospitals between 1913–1922.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 301–306. With 1 map. [3 refs.]

ii. —— & ——. **Kala-Azar in the Madras Presidency outside Madras City.**—*Ibid.* pp. 308–311. With 1 map. [7 refs.]

i. A survey of 663 cases of kala azar admitted to Madras Hospital between 1913 and 1922 and a similar survey made by KORKE for the years 1904–11 show that there is a maximum intensity in the neighbourhood of George Town, and that this focus is surrounded by other foci which were originally regarded as places to which kala azar cases had migrated. Cases have now been recorded in areas 6 to 7 miles south of the city, and this would appear to indicate a gradual extension of the disease since 1912.

ii. Evidence is brought forward to show that apart from Madras city itself no endemic focus of kala azar exists in Southern India. It is possible cases have originated in Trichinopoly, Ponneri, Pondicherry and Bangalore, but there is no evidence that these places are at the present time endemic foci of the disease.

C. M. W.

KNOWLES (R.), NAPIER (L. E.) & GUPTA (B. M. Das). **The Kala-Azar Transmission Problem.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 321–349. With 4 plates & 2 maps. [44 refs.]

In this long article the authors review the present position of the kala azar problem in India. Very little new information is included, but the various theories which have been advanced are logically discussed. It is concluded that the parasite should be retained in the genus *Leishmania* and not in *Herpetomonas*, chiefly because it appears to be primarily a parasite of man and not of an insect. It is believed that the evidence available points to escape of the parasite by way of the blood-stream. The want of an easily-infectible laboratory animal is a serious handicap to investigators, as there is no means of demonstrating the infectivity of a possible insect vector. Attempts to infect frogs have led to a transitory visceral infection after injections into the lymph sac, but these vertebrates hold out no better promise than the ordinary laboratory animals which are infected with such difficulty and uncertainty. The bug, *Conorhinus*, in which, it is reported, development of the parasite takes place, and *Phlebotomus* are regarded as worthy of investigation from the transmission point of view. It is believed that some secondary factors, such as enteric fever, relapsing malaria and dysentery play some part in determining the onset of kala azar. There occur in inoculated animals symptomless infections which can only be detected by culture, and the question arises as to whether a similar condition may not exist in man. Though the belief is held that the parasite escapes from the blood, where it is practically invariably present, as demonstrated by the culture method, the possibility of infection by way of the mouth has still to be considered, as in one case a fatal and heavy infection was induced in a monkey by feeding it with spleen emulsion. The much discussed " thick tail " form of the flagellate phase is regarded as a result of degeneration, as similar forms have been encountered in the case of the common herpetomonad of the house-fly.

The article is a carefully reasoned summary of the kala azar situation, but it leaves the impression that its solution is still in a condition of complete obscurity. The authors deplore the fact that the financial circumstances of India to-day do not permit of a well-organized kala azar commission under unified direction.

C. M. W.

NICOLLE (Charles) & ANDERSON (Charles). **Recherches expérimentales sur le mode de transmission du kala azar.**—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 168–198. With 2 text figs. [1 ref.]

In a series of most carefully conducted experiments the authors have attempted the transmission of kala azar from dog to dog by means of dog fleas. The elaborate technique employed for keeping the animals free from ectoparasites and the disposition and arrangement of the cages are described in detail. The experiments were carried out at different seasons of the year and everything possible seems to have been done to avoid fallacious results. Eight dogs in all were exposed to the bites of numerous fleas which had fed upon known infected animals. The exposure to these fleas lasted from three weeks to seven months, but in no case was there transmission. It is concluded that these experiments lend no support to the view that canine kala azar is conveyed from dog to dog by the flea, *Ctenocephalus canis.* These researches, carried out with great care, afford a remarkable contrast with those conducted in Italy by BASILE, who claimed to have sucessfully transmitted the disease by means of fleas.

C. M. W.

ARCHIBALD (R. G.). **Kala-Azar in the Sudan with Special Reference to its Treatment by Tartar Emetic.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 307–324. With 1 chart. [15 refs.]

This paper is a review of the present position of kala azar in the Sudan. Cases occur sporadically, and, apart from a few amongst Sudanese troops on the Abyssinian frontier in 1913 and 12 to 15 amongst troops in the Melut district, nothing like an epidemic has been known. The Sudan virus is easily inoculated to the grey and the red monkey and to the jerboa and gerbil, but dogs can be infected only by massive doses. Other animals have proved refractory. Under the heading of treatment it is shown that of 15 cases, some of which were early, treated by intravenous injection of tartar emetic on the usual lines, 13 proved fatal. The reaction to the drug appears to indicate that it is better to commence with small doses and to proceed more slowly than in the method usually advocated. The less intensive treatment has, in the hands of Colonel BIGGAR, given, even in advanced stages of the disease, very satisfactory results.

C. M. W.

BECKER (Elery R.). **Studies on the Relationship between Insect Flagellates and Leishmania.**—*Amer. Jl. Hyg.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 462–468. [12 refs.]

Further attempts have been made by the author to infect laboratory animals with flagellates of invertebrates. The organisms used were *Crithidia gerridis, Herpetomonas muscae-domesticae* and *Crithidia melophagia* (=*Trypanosoma melophagium*). In these experiments 17 rats, 3 mice, 1 rabbit and 1 guinea-pig were employed. In no case was infection noted after direct examination of smears and culture tests. The results are thus a confirmation of those obtained by HOARE and by SHORTT [this *Bulletin,* Vol. 18, p. 185; Vol. 20, p. 784], and are strikingly different from the numerous successes claimed by FANTHAM and PORTER, and FRANCHINI. Evidence is accumulating that the results reported by these observers are not those which will usually be obtained.

C. M. W.

BLACKLOCK (B.). **The Aetiology of Kala-Azar and Tropical Sore.**—*Lancet.* 1923. Aug. 11. pp. 273–274. [12 refs.]

On two occasions the author, while sitting in the open in Freetown, was bitten on the ankle by a plant bug, *Dysdercus superstitiosus.* On each occasion an irritating swelling developed. One of these bugs was induced to bite experimentally and this was followed by extensive swelling of the leg, oedema and great itching. There was no general reaction, but the blood showed an eosinophilia. Dissection of the bugs showed that the alimentary tract and sometimes the coelomic fluid harboured Herpetomonas. It is known that in allied bugs the flagellates may occur in the salivary glands.

Flagellates of the same type occur in plants, and FRANCHINI and others claim that insect flagellates can be inoculated to vertebrates, and, further, FRANCHINI states that insect flagellates, as also leishmania, will grow in media containing plant juices. Reflecting on these observations, the author thinks that his experience with the plant bugs in West Africa affords a strong argument for the thorough investigation of the habits and bionomics of such forms before they are dismissed from consideration in connexion with kala azar and tropical sore.

C. M. W.

YAKIMOFF (W. L.). **Studi sul Kala-Azar.**—*Pediatria.* 1923. Aug. 1. Vol. 31. No. 15. pp. 811–816. [1 ref.]

During the investigations on kala azar conducted by the author in Turkestan in 1913 leishmania were found in the peripheral blood of 10 out of 23 cases. Attempts at cultivating the parasite from the peripheral blood were not successful. That of a dog heavily infected with the Tunisian strain of leishmania gave a positive result on one occasion.

Attention is drawn to what is called a new method of diagnosis. From a case of kala azar, in the peripheral blood of which no leishmania could be found, a few drops of blood were taken and injected into the caudal vein of a mouse. Four weeks later the mouse died and leishmania were found in its liver and lungs. [Infection of mice with material so poor in leishmania is contrary to all previous experience, which demonstrates that in order to produce infection at all large doses of virus must be employed.] The author draws attention to the coexistence of malarial parasites and leishmania in certain cases.

C. M. W.

SHORTT (H. E.). **The Recovery of** *Herpetomonas donovani* **from the Urine of a Kala-Azar Patient.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 319–320. [1 ref.]

In a case of kala azar associated with oedema the author noted that the urine showed a large deposit. Sterile urine was obtained after antiseptic precautions without the use of a catheter. The centrifuged deposit was inoculated to six tubes of N.N.N. medium, in two of which cultures of leishmania were obtained. These behaved in every way like the strains of the parasite obtained from the blood.

C. M. W.

AURICCHIO (Luigi). **L'azione degli stimoli leucocitogeni nelle anemie spleniche dell' infanzia.**—*Pediatria.* 1923. Sept. 1. Vol. 31. No. 17. pp. 922–937. With 1 chart. [8 refs.]

Injections of nucleinate of sodium and adrenalin in the case of healthy children raises the leucocyte count by 3,000 with an increase in the percentage of polynuclears and the appearance of immature cells. Corresponding doses have no effect in cases of infantile kala azar. In cases of splenomegaly of tubercular origin the increase was less marked and less quickly developed than in healthy children, while in cases of splenomegaly of syphilitic origin there was an increase up to 30,000, which persisted for 2–3 days.

C. M. W.

BANERJEE (Dhirendra Nath) & SAHA (Jugal Charan). **On the Possible Function of Adrenals in Kala-Azar.**—*Calcutta Med. Jl.* 1923. Apr. Vol. 17. No. 10. pp. 145–150. [10 refs.]

In cases of known adrenal insufficiency a series of symptoms appear which clearly resemble those of kala azar. In such cases intramuscular injections of adrenalin will cause a rise in blood pressure, increase in the pulse rate and tremors of the hand and feet, together with vasomotor reaction, palpitation, precordial pain and other symptoms. Similar tests in cases of kala azar appear to indicate that in this disease there is adrenal insufficiency, and the author suggests that the parasite may act by producing fever on the one hand and by exhausting the adrenals on the other, and that all the features of kala azar may be due to the second factor.

C. M. W.

CHATTERJEE (H.). **An Unusual Complication in Kala-Azar.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 313–314.

A record of a case of kala azar in which acute symptoms suddenly supervened as a result of haemorrhage into the peritoneal cavity. The fluid was removed by tapping, an operation which had to be repeated twelve days later. The spleen was much enlarged and puncture revealed numerous leishmania. After a course of potassium antimony tartrate the patient completely recovered.

C. M. W.

SHORTT (H. E.) & SEN (Ram Taran). **Clinical Kala-Azar Work performed at the Special Kala-Azar Hospital, Shillong, during 1922.** —*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 289–293. [2 refs.]

The author explains that the type of case referred to in the paper differs in certain respects from those in other hospitals. In Assam at the present time there exist so many centres where the antimony treatment of kala azar is carried out that the cases which enter the Shillong Hospital are either the more severe ones or those which have relapsed after one or more courses of treatment elsewhere. The routine treatment adopted at the hospital previously by KNOWLES was the administration of a total of 200 cc. of a 1 per cent. solution of tartar emetic. The authors of the paper under review point out that in the majority of cases uncomplicated by other grave constitutional diseases larger quantities can be safely given, and that if 200 cc. only is is received a considerable proportion of the cases relapse.

In this series of cases no hard and fast rule was laid down: each case was treated on its individual merits and the antimony salts treatment was pushed till symptoms of intolerance began to appear, usually in the form of pains in the joints. In most cases these signs did not occur before 2 gm. of the drug had been given, and when they did occur before this, treatment was not stopped but the dosage was increased more slowly. Intravenous injections were given on every second day, commencing in adults with 3 cc. and proceeding to a maximum of 8 cc., which was generally reached at the sixth injection. All the cases referred to had been properly diagnosed. The details of the course and treatment are arranged in tabular form. Forty-two cases were treated with sodium antimony tartrate, and of these 27 were discharged as cured, 8 died, 4 were only relieved, while the remaining three were discharged for other causes. There appeared to be no ground for supposing that any previous course of treatment had rendered the cases more resistant to the drug.

Three cases were treated with ammonium antimony tartrate supplied by BRAHMACHARI. The cases received a total of 303, 260 and 121 cc. of a 1 per cent. solution respectively and all were discharged cured. The result was in no way superior to that obtained with the sodium salt.

Another drug supplied by BRAHMACHARI was urea stibamine. The initial dose employed was 0·1 gm. dissolved in cold sterile distilled water. Each subsequent dose, given on alternate days, was increased by 0·05 gm. till a maximum of 0·25 gm. was reached. Four cases were treated with the following total dosage in grams: 1·7, 1·7, 1·7, 2·295. The results are said to be most encouraging and are actually much better than those claimed by BRAHMACHARI himself. The advantages over the antimony preparations usually employed are these: (1) The short course necessary to complete the cure—2–3 weeks. (2) The rapid disappearance of symptoms. (3) Absence of signs of intolerance.

Formalin and trypan blue injections were tried in six and two cases respectively, with apparently no good result.

An attempt was made to improve the action of the drugs employed by counteracting the acidosis of the blood. Whereas in a normal native 10 gm. of bicarbonate of soda was sufficient to render the urine slightly alkaline, in kala azar cases 25 gm. was necessary. This procedure had apparently no influence on the treatment. Some remarks are made about the method of performing spleen puncture and the formol-gel test, which was found to be very definitely positive in the majority of cases. In early kala azar and malaria cases with large numbers of parasites in the blood it may be misleading. Where spleen puncture is not possible it is a valuable aid to diagnosis.

C. M. W.

BANERJI (Dhirendra Nath). **Some Interesting Kala-Azar Cases.**—*Calcutta Med. Jl.* 1923. June. Vol. 17. No. 12. pp. 265–267.

Two cases of kala azar are described in which severe after-effects resulted from the injection of sodium antimony tartrate. In one case severe cutaneous burning sensations appeared at the end of the second day after the first dose (½ cc. of 2 per cent. solution). This condition persisted till on the fifth day the patient became delirious and on the seventh day semi-comatose. There was cardiac disturbance, the heart missing beats. A condition of cancrum ani developed, but the critical condition showed signs of passing away on the fourteenth day. A month later treatment by intramuscular injections of hyperacid antimony tartrate was commenced. The treatment was well tolerated at first, but oedema associated with albumen and casts in the urine supervened and the patient died.

The second case proved very resistant to antimony treatment. There was improvement at first, but later, in spite of continued treatment, during which the form of antimony used was varied, the fever persisted. Finally, extensive cancrum oris developed. Stibenyl was then tried, but this produced severe vomiting, purging and pains all over the body. In all, five injections of stibenyl were given, when the patient returned home, where he contracted pneumonia. After being unconscious for a week he gradually recovered at the middle of 1921, and has remained in good health since.

Another case is mentioned in which injection of antimony tartrate produced severe reaction without any effect on the fever. Colloidal antimony sulphide was then given. The patient quickly responded and has remained well for the last five years. The author has noted in other cases the good effects of antimony sulphide after a preliminary course of antimony tartrate.

C. M. W.

MACKIE (F. P.) & PATNI (Hari Charan). **The Evidence of Cure in the Treatment of Kala-Azar by Antimony.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 293–295.

The generally accepted full course of antimony tartrate, viz., 200 cc. of a 1 per cent. solution, is in many instances ineffective in curing cases of kala azar. The clinical signs which suggest a cure are cessation of fever, increase in weight, reduction in the size of the spleen, increase in the total leucocyte count, and the physical appearance of well-being and the loss of the epidermal signs. In treatment each case must be considered on its own merits and the drug administered till all or most of the above-mentioned criteria are evident. Even when all these are fulfilled the patient may still be harbouring living leishmania, though stained smears reveal none, so that failure to grow the parasite from spleen puncture material is the only real evidence of cure. Insufficiently cured cases are a danger in that they may act as chronic carriers.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Further Observations on the Toxicity of Antimonial Compounds—Delayed Antimony Poisoning. Part III.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 196–213.

With a view to their possible use in the treatment of kala azar the following antimonial compounds were tested as to their toxicity on animals: Lithium antimonyl tartrate, Calcium antimonyl tartrate, Strontium antimonyl tartrate, Ethyl antimonyl tartrate, Quinine antimonyl tartrate, Cinchonine antimonyl tartrate, Narcotine antimonyl tartrate, Sb_2O_3 dissolved in glycerine and in tartaric acid.

The quinine salt is the least toxic of the series, but for the reason that the quinine is likely to bring about a dangerous fall in blood pressure it cannot be recommended for use in kala azar. The Sb_2O_3 glycerine solution comes next, but this cannot be administered intravenously. The same oxide of antimony dissolved in tartaric acid is the basis of the author's hyperacid antimonyl tartrate which has given satisfactory results when injected intramuscularly. Old solutions of tartar emetic and old samples of stibenyl have proved to be more toxic than fresh ones. Guinea-pigs may die three weeks after one injection of an antimonial salt and show definite symptoms of antimony poisoning and presence of antimony in the viscera.

C. M. W.

JEMMA (Rocco). **Considerazioni sulla diagnosi e sulla terapia della leishmaniosi infantile.**—*Pediatria.* 1923. June 15. Vol. 31. No. 12. pp. 633–640. With 2 plates. [1 ref.]

After a long experience of infantile kala azar in Italy and patient investigation the author is convinced that the best remedy is still tartar emetic administered intravenously. Neither stibenyl nor other antimony compounds have given results which can compare with those obtained with the older remedy.

C. M. W.

CUNNINGHAM (J.) & VARADARAJAN (P. S.). **Notes on the Results of Treatment of Cases of Kala-Azar admitted to the Madras City Hospitals between 1913–1922.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 307–308.

Between the years 1913 and 1922 there were admitted to the Madras hospitals 708 cases of kala azar. In the pre-antimony period there were 2·2 per cent. of cures compared with 34·7 per cent. in the later period.

C. M. W.

SHORTT (H. E.). **The Pathology of Acute Experimental Kala-Azar in Monkeys.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 186–195. With 2 figs. & 2 plates. [5 refs.]

The pathological findings in two monkeys (*Macacus rhesus*) which acquired an acute and rapidly fatal infection after inoculation with kala azar material are described. The disease in these animals is essentially the same as in man, the infection being eventually one of the endothelial tissues, especially that of the blood vessels.

C. M. W.

BRAHMACHARI (Upendra Nath) & SEN (Parimal Bikash). **The Globulin Opacity Test for Kala-Azar.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 295–296.

It was shown by the first of the authors of this paper that the addition of distilled water to the serum of kala azar patients gave a precipitation of globulins either as a diffused precipitate when the fluids were mixed, or as a ring when the one was superimposed on the other. There appears to be no doubt that the precipitate is globulin, which is responsible for the opacity which occurs in the formaldehyde test for kala azar (formol-gel test). By estimating the quantity of water-precipitable globulin present in serum the authors have succeeded in elaborating a test which they call the *globulin opacity test.* One part of serum is mixed with six parts of distilled water. After uniform mixing the liquid is poured into a graduated (in inches) cylinder with a diameter of 1 inch. At the bottom of the cylinder are fixed some black spots and the fluid is poured in till the spots are only just visible. It was found that in kala azar a value was obtained which was fairly diagnostic of the disease. The height in inches is inversely proportional to the amount of globulin present. A reading of 1·25 inch or less may be regarded as positive.

C. M. W.

IYENGAR (K. R. K.). **Studies in the Value of the Wassermann Test. No. V. Significance and Value of a Positive Wassermann Reaction in Kala-Azar.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 237–238. [3 refs.]

Serum from thirty cases of kala azar gave a positive Wassermann reaction in six instances. As this figure is not in excess of that obtained from an average Indian male population, it can be assumed that kala azar does not lead to a positive Wassermann reaction.

C. M. W.

HARTMANN-KEPPEL (G. L.). **Un mode d'inoculation de la leishmaniose cutanée.**—*Rev. Méd. et Hyg. Trop.* 1923. July–Aug. Vol. 15. No. 4. pp. 135–138.

If the statements recorded in this paper are to be accepted as accurate they are of the utmost importance from the point of view of the etiology of Oriental sore and kala azar. The author points out that during the occupation of Syria both British and French troops were encamped round Aleppo. Amongst them there occurred only a few cases of Oriental sore, whereas in the town itself the children and visitors continued to be infected. It was concluded that bed-bugs alone could be responsible for such a difference of incidence of the disease. Accordingly the author examined bed-bugs collected from a locality in the town where the disease was common. The probosces of 87 bugs were examined and it was found that in 28 of these leishmania occurred. They occupied that part of the proboscis where the stylets arise, but not the stylets themselves. The intestine and body cavity of the bugs were free from parasites. The organisms found were ovoid in form but not longer than 0·75 to 1·0 micron. They contained a nucleus and a short centrosome usually lying near the nucleus. It is stated that cultures in N.N.N. medium were obtained by placing probosces of bugs in the water of condensation. The cultural forms were said to develop an undulating membrane.

The author also states that five cases of Oriental sore which showed enlargement of the spleen were examined by spleen puncture. In four of these malarial parasites were found, while in three leishmania occurred.

It is unfortunate that the so-called leishmania from the proboscis of the bug are not figured. The size rather suggests some other organism, while the author's remarks about the cultural forms leads one to suspect that he is not familiar with the details necessary for this kind of work. If there is any truth in his conclusions confirmation should soon be forthcoming.

C. M. W.

STANCANELLI (Pietro). **Un caso di triplice bottone di oriente al volto, di cui due dovuti probabilmente a metastasi per via linfatica.** [A case of Three-fold Oriental Sore on the Face, Two probably due to Metastasis by Lymphatics.]—*Giorn. Ital. d. Malat. Vener. e. d. Pelle.* 1923. Feb. Vol. 54. (58th Year.) pp. 37–42.

The author records a case of Oriental sore in Italy in which three lesions occurred, two of which appeared two months after the first. This suggests that the three sores were not the result of three separate inoculations, but rather that the two which appeared later were the result of dissemination of the virus by way of the lymphatics.

C. M. W.

ANDREWS (L. A.). **Three Cases of Tropical Sore.**—*Jl. Roy. Army Med. Corps.* 1923. May. Vol. 40. No. 5. pp. 371–372.

Three cases of Oriental sore, which were treated with 2 per cent. tartar emetic ointment, are described. In the first case, after the ulcer had been cleaned with fomentations, the ointment spread on lint was applied one morning and again in the evening. The second application caused considerable pain, and on the following day the appearance was not encouraging. No more antimony was used, the lesion being treated as an ordinary granulating wound. Healing was uninterrupted, the patient being discharged cured on the tenth day.

On account of the severe reaction the second case was treated with antimony ointment only once a day, for some time without effect. Two applications a day were then made till a severe local reaction occurred, after which healing took place.

The third case likewise cleared up after the ointment had produced a considerable local reaction.

C. M. W.

KENNEDY (J. C.). **Three Cases of Tropical Sore.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1923. Aug. Vol. 41. No. 2. p. 157.

In dealing with single lesions in cases of Oriental sore tartar emetic ointment has given satisfactory results at Basra. The essence of the treatment is the production of a very considerable local reaction, which is usually achieved by a twenty-four hours' application. The patient should be forewarned of the pain which is caused. Some sloughing of the parasitized cells occurs and the subsequent cleansing and healing of the sore are assisted by simple fomentations. In the case of extensive involvement of the face, and multiple lesions, the intravenous method is to be preferred.

C. M. W.

CASTELLANI (Aldo). **Phosphorus in the Treatment of Dermal Leishmaniosis.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 194–195.

As already reported [this *Bulletin*, Vol. 20, pp. 576 & 686], the author has found that injections of phosphorated oil have a marked effect on Oriental sore. Treatment is carried out by injecting 5 minims of the oil once or twice a week in several places into the nodule itself and under the skin around its periphery. Four cases have been treated by this method, with very satisfactory results. It is again emphasized that the oil should be of recent preparation.

C. M. W.

ZENIN (A.). **Zur Frage der ärztlichen Behandlung der Haut-Leischmaniose.** [Medical Treatment of Leishmaniasis of the Skin.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1923. Vol. 2. No. 1–2. In Russian, pp. 21–23. Abridged Version in German, pp. 88–89.

Having under observation a case of Oriental sore with seven lesions, the author tried various lines of treatment. To one sore were applied compresses of aqueous salvarsan solution for 26 days without result, while another was sprinkled with powdered permanganate of potash for 30 days, also without result. Another sore was excised. The wound healed completely. Two intravenous injections of salvarsan were followed in 20 days by almost complete healing of all the sores. It is concluded that surgical measures, though giving good results, are not always applicable. Salvarsan, however, is a specific and should be generally used. [Such good results with salvarsan are not usually obtained, and it is evidently unsafe to make generalizations from a single case of Oriental sore, a disease in which unexpected spontaneous healing often occurs.]

C. M. W.

i. D'ASTROS, GIRAUD (P.) & RAYBAUD (J.). **Quatre cas autochtones de kala-azar infantile observés à Marseille.**—*Bull. Acad. Méd.* Paris. 1923. July 31. Year 87. 3rd Ser. Vol. 90. No. 31. pp. 114–118.

ii. JEMMA (R.). **Leishmaniosis infantum. (Innere Leishmaniose, Leishmansche Anämie, Kala-azar.)**—*Ergebnisse der inneren Medizin und Kinderheilkunde.* 1923. Vol. 23. pp. 595–647. With 8 text figs. [642 refs.]

iii. NEEB (H. M.). **A Serious Case of Infantile Leishmaniosis cured by Intravenous Injections of Tartras-Kalico-Stibicus (émétique).**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. pp. 274–282. With 6 Charts.

iv. BRAHMACHARI (U. N.). **Dermal Leishmanoid.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 182–183.

i. During the past six months four cases of infantile kala azar have been seen by the authors in Marseilles, all in children who had never left the town or its environs. There was nothing peculiar about the cases, which were all diagnosed by spleen puncture.

ii. A general account of infantile kala azar. The author, who has had an extensive experience in Italy, gives, as was to be expected, a thoroughly up-to-date account of the disease in all its aspects.

iii. A record of a case of kala azar in a child seven years of age who had come to Batavia after having contracted kala azar either in Calcutta or Persia. Diagnosis was made by discovery of the parasite and its successful culture. Treatment with intravenous injections of tartar emetic resulted in complete recovery.

iv. The case described in this paper, of a man who developed an extensive cutaneous eruption in which leishmania were found after he had been treated for kala azar, has already been dealt with [this *Bulletin*, Vol. 19, p. 551].

C. M. W.

i. SERGENT (Etienne). **Chronique du bouton d'Orient en Algérie. Un nouveau cas sur le littoral.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. p. 159. [1 ref.]

PIQUEMAL (M.). **Le bouton d'Orient aux Ouled Djellal.**—*Ibid.* pp. 160–163.

BIDAULT (R.). **Un foyer de bouton d'Orient dans les oasis du Souf (Sahara Constantinois).**—*Ibid.* pp. 164–168. With 7 figs. [5 refs.]

ii. VON SCHROETTER (Hermann). **Zur Kenntnis der Leishmaniosis cutanea, der sogenannten Orientbeule.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Vol. 27. No. 7. pp. 234–246. With 5 plates containing 21 figs. [3 refs.]

iii. BEHDJET (Houloussi). **Die Behandlung der Orientbeule mit Diathermie.**—*Dermat. Woch.* 1923. May. 19. No. 20. pp. 433–438.

i. In Algeria Oriental sore is of rare occurrence outside the Sahara oases. Hitherto only three properly diagnosed cases have been recorded. A fourth has now been encountered and forms the subject of this note.

At Ouled Djellal, 90 kilometres south-west of Biskra, has been found an endemic focus of Oriental sore, four properly diagnosed cases of which are recorded.

The Souf oasis, which lies 220 kilometres south-east of Biskra, proves to be an endemic focus of Oriental sore, and the author records six cases, in five of which leishmania were found.

ii. A general account of Oriental sore based on observations made in 1917 in Syria and Mesopotamia. No new information is given, but the author states that he obtained evidence that Phlebotomus was probably the vector of Jericho boil.

iii. Three cases of Oriental sore, which were treated by diathermy are described. From the results obtained in this limited series of cases the author concludes that diathermy is the ideal method of treatment.

C. M. W.

RELAPSING FEVERS AND OTHER SPIROCHAETOSES.

DUNN (Lawrence H.). **The Tropical Bedbug in relation to the Transmission of Relapsing Fever in Panama.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 345–350.

Employing the Panama strain of the relapsing fever spirochaete, the author attempted to transmit the organism to a rat and two monkeys by means of bed-bugs fed either on an infected human being or rat. Twenty-four hours was the shortest interval between the feeds on the infected and uninfected animals. In the first experiment on a rat 50 bugs were employed, and these inflicted 704 bites on the animal between the third and eighth day of the experiment. In the second experiment (monkey) 56 bugs inflicted 106 bites on the second and third day, while in the third experiment 8 bugs inflicted 40 bites on a monkey on the thirty-fifth and thirty-sixth day. In no case did an infection result. Macerated bed-bugs which had ingested spirochaetes 32 days before produced infection when injected into animals, while the coelomic fluid of bugs was found to harbour spirochaetes 15 days after feeding.

C. M. Wenyon.

MOSELLI. **Observations sur la fièvre récurrente au Soudan.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. p. 272.

By the method of triple centrifugation of 10 cc. of blood the author has been able to demonstrate the presence of scanty spirochaetes in the blood of a relapsing fever case in the interval between two attacks of fever. Injections of trepol have in most cases been efficacious in preventing relapses, but the fever does not subside for a couple of days.

C. M. W.

ZLATOGOROFF. **Zur Erkennung des Rückfallfiebers.** [Diagnosis of R.F.]—*Deut. Med. Woch.* 1923. July 27. Vol. 49. No. 30. pp. 973–974.

As there was considerable difficulty in arriving at a diagnosis in certain cases of relapsing fever, the author has attempted to elaborate a complement-fixation test. After some experiment it was found that an antigen prepared from the spleens of infected mice gave the best results. Of 18 cases tested during the febrile period 16 gave a definitely positive result, while of 50 during the afebrile period 42 were positive. No positive result was obtained in other than relapsing fever infections. A cutaneous test was also made. Blood from the vein of a heavily infected case was diluted with 2-3 volumes of distilled water and kept in the incubator for five days. The liquid was centrifuged and the deposit incubated at 58° C. for 30 minutes. This antigen was used for cutaneous inoculation according to PIRQUET's method. In six cases tested during the febrile period there was no reaction, while a positive reaction was obtained in 25 of 26 cases tested during the afebrile period. Normal human blood which had been treated in the same way was used as a control. The complement-fixation test has given a positive result as long as six weeks, and the cutaneous test two weeks, after the last relapse.

C. M. W.

BLANCHARD & LEFROU (G.). **Une erreur de diagnostic : fièvre récourrente à manifestation méningée, prise pour maladie du sommeil.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 394-395. [2 refs.]

Attention is called to an error in diagnosis which resulted from the acceptance of the statement of an experienced laboratory assistant. The blood of a native in the Congo was examined by this man, who noted a movement amongst certain red blood corpuscles. He concluded that this was due to a trypanosome. A lumbar puncture appeared to confirm the diagnosis of trypanosomiasis and the patient was treated with atoxyl. During the treatment the patient's blood was examined by the centrifugation method, with the result that the only parasites discovered were spirochaetes of the recurrent type. It is evident, therefore, that even in a laboratory where men experienced in the diagnosis of trypanosomiasis are employed such errors may arise unless caution is exercised, while the case examined serves to illustrate how natives frequently fail to show the characteristic symptoms of the disease from which they are suffering and how in relapsing fever the cerebrospinal fluid, in regard to hyperleucocytosis and hyperalbuminosis, may simulate that from cases of sleeping sickness.

C. M. W.

CATANEI (A.). **Infection sanguine à spirochètes, de longue durée, sans symptômes apparents, chez des enfants indigènes algériens.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 392-394.

During the course of a malarial survey in Algeria five children of one family were examined. Spirochaetes of the relapsing fever type were found in blood films from four. In two spirochaetes were again found 54 days later, and in one 98 days after the first examination.

SERGENT and FOLEY have informed the writer that they had under observation an Arab child which during a period of 66 days suffered from relapsing fever with four relapses.

It is evident the disease is sometimes of long duration, and that during the relapses, which may be of a very mild nature, it may escape detection entirely.

C. M. W.

YAKIMOFF (W. L.) & SOLOWZOFF (A. S.). **Essais de traitement de la fièvre récurrente par l'émétique.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 303-304. [2 refs.]

Owing to the difficulty of obtaining salvarsan in Russia the authors were led to attempt the treatment of relapsing fever with tartar emetic in view of a statement made by CASTELLANI that in Macedonia this drug, though inferior in its action to salvarsan, appeared to have the property of preventing relapses [this *Bulletin*, Vol. 9, p. 258]. The authors injected intravenously a 1 per cent. solution. A dose of 4 cc. appeared to have no action, so this was increased up to 18 cc. In this dose the drug seemed to bring about the crisis within a few hours or next day, but did not prevent the relapses. The authors agree that its action is very inferior to that of salvarsan, but hesitate to state that it has no action at all.

C. M. W.

PLETNEW (D.). **Ueber die Anwendung von "1882" bei Rekurrens.**—[The Employment of "1882" in R.F.]—*Deut. Med. Woch.* 1923. May 25. Vol. 49. No. 21. pp. 671–672.

The author has investigated the action in cases of relapsing fever and malaria of the preparation "1882," which, according to Professor KOLLE, is a 10 per cent. solution of an arsenobenzol derivative. For a single dose 12–15 cc. are injected, presumably intravenously, as he compares its action with that of "606" and "914." The drug appears to be a specific for relapsing fever, which in the great majority of cases is immediately cured. It was tested also on two cases of malaria which had been refractory to quinine. One of these in particular had proved very resistant. After a single injection of "1882" followed by further quinine treatment there were no attacks of fever during the two and a half months the patient was under observation.

C. M. W.

ANDING (Curt Emil). **Ueber die Wirkung des Arsenpräparates "Arsalyt" bei Febris recurrens.** [The Action of "Arsalyt" in R.F.]—*Deut. Med. Woch.* 1923. Aug. 31. Vol. 49. No. 35. pp. 1150–1151. [19 refs.]

The author's experience of relapsing fever in Odessa has shown that "Arsalyt" (dimethylaminotetraaminoarsenobenzol) with its 26·5 per cent. arsenic content is a specific against the disease. The drug is put up in ampoule form, and in intravenous doses of 8–10 cc. for a man, 6–8 cc. for a woman and 1–3 cc. for a child it brings about a *Therapia sterilisans magna.* It acts quickly, has no unpleasant after-effects, does not upset the heart, and is not irritating to the kidneys even in cases of acute nephritis.

C. M. W.

DARGEIN & PLAZY. **Traitement de la Bronchite sanglante.**—*Arch. Méd. et Pharm. Nav.* 1922. Nov.–Dec. Vol. 112. No. 6. pp. 478–482. [9 refs.]

Three cases of bronchial spirochaetosis are described. It is evident from the multiplicity of remedies which have been advocated that none of them is very efficacious. In one of the three cases three courses of intravenous injections of novarsenobenzol failed to cure the condition, though the general health and weight of the patient were improved; he left hospital still coughing up blood-stained sputum. The two other cases were treated with intramuscular injections of lipoidol: there was rapid improvement and the patients were discharged cured.

The authors mention observations made by VIOLLE (*C. R. Soc. Biol.*, 22nd October 1921), which indicated that the spirochaetes originate in the soil and infect man by way of fresh fruit and vegetables.

C. M. W.

DJÉMIL (Saïd). **Remarques sur la spirochétose intestinale à Constantinople.**—*Bull. Sanitaire de Constantinople.* 1923. June. Nos. 15 & 16. pp. 139–141. [4 refs.]

From observations on the presence of spirochaetes in the faeces of human beings suffering from diarrhoea or amoebic dysentery the author is led to suspect that in Constantinople as in other places there is a seasonal incidence of the infection. A much higher percentage were found infected during the period July to September than in that from October to February. Some remarks are made about the character of the stools in the purely spirochaetal cases and those in which amoebae occurred also. In certain purely spirochaetal cases the organisms disappeared after the use of salines. In one resistant case the infection was eradicated by the intravenous injection of salvarsan. In cases associated with the presence of amoebae emetine caused the disappearance of both parasites as a rule ; in one refractory case salvarsan treatment gave the desired result.

C. M. W.

Delamare (G.) & Alalou. **Fréquence et périodicité de l'excrétion des spirochètes fécaux.**—*Bull. Sanitaire de Constantinople.* 1923. May. Nos. 13 & 14. pp. 119–122. With 1 graph. [3 refs.]

The presence of spirochaetes in the faeces of human beings shows a seasonal incidence which reaches a maximum in the aestivo-autumnal period of the year. In individual cases subjected to repeated examinations it was found that the number of spirochaetes present exhibited marked fluctuations.

C. M. W.

RAT-BITE FEVER.

Pellegrini (Augusto). **Il Sodoku in Italia.**—*Riforma Med.* 1923. Apr. 16. Vol. 39. No. 16. pp. 363–371.

Having had under observation three cases of rat-bite fever the author gives a full account of the disease as it is known to occur in Italy. He describes his three cases together with three others of which he obtained the notes. He reviews the previous records of the disease in Italy and finds that 23 other cases have been described, in 5 of which the causative organism was discovered. In none of the 6 cases noted by him was the spirochaete seen. The incubation period varied from 7 to 28 days while the disease persisted from two months to two and a half years. The symptoms and treatment are described in detail. Salvarsan injections have given the best results, while the local lesion has been successfully treated with radium.

C. M. Wenyon.

Walch (E. W.). **Twee gevallen van Rattebeetziekte.** [Two Cases of Rat-Bite Fever].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 239–259. With 7 figs. [English summary, pp. 259–260.] [13 refs.]

This paper, which is illustrated with instructive temperature charts and photographs of the papular eruption on the face, chest and back, describes two cases of rat-bite fever from which the typical spirochaete was isolated. It was found in small numbers in the blood of both cases and in the papules of one. Guinea pigs were infected from the blood of one of the cases and the strain of spirochaete was passed through three animals. The animals showed an incubation period of 12–15 days and, apart from a slight elevation of temperature and loss of hair, there was no sign of illness.

C. M. W.

DELAMARE (G.) & MOUCHET (A.). **Examen histologique de la cicatrice cutanée, d'un tronc lymphatique at d'un ganglion dans un cas de sodoku.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. June 14. Year 39. 3rd Ser. No. 20. pp. 845–847.

In a case of rat-bite fever the authors were able to excise from the arm a portion of the cicatrix from the site of the rat bite, a piece of the main lymphatic vessel and a lymphatic gland. They describe in detail the histological abnormalities of these tissues. Not only are the lymphatic vessels and glands altered in structure but also the smaller blood vessels. The lumen of the lymphatic vessel was still open though the endothelial lining was replaced by elongate connective tissue cells; its wall was infiltrated with lymphocytes and numerous haemorrhages occurred. The capsule of the gland was sclerosed and beneath it were many haemorrhagic areas. The blood vessels were altered in appearance. The main feature of the tissues examined was a marked lymphoid reaction without necrosis.
C. M. W.

PARMANAND (M. J.) **Rat-Bite Fever with Special Reference to its Aetiological Agent. (Preliminary Communication).**—*Indian Jl. Med. Res.* 1923. July. Vol. 11, No. 1. pp. 181–185. With 2 charts and 1 plate. [2 refs.]

An investigation of four cases of rat-bite fever reveals some new facts regarding the causative organism of the disease as it occurs in Bombay. In the main the author's observations are a confirmation of those of Row [see this *Bulletin* Vol. 12, p. 217]. who was the first to study rat-bite fever and its causative organism in this country. Row, however, failed to demonstrate the flagella and was inclined to regard the organism as distinct from *Spirochaeta morsus muris* of Japanese writers. He proposed to call it *Spirochaeta petit.* The author of the paper under review has been able to demonstrate the terminal flagella, so that there appears to be little reason to regard the Bombay spirochaete as a distinct organism.
C. M. W.

POWELL (Arthur) & BANA (F. D.). **Treatment of Rat-Bite Fever with Injections of Cacodylate of Soda.**—*Indian Med. Gaz.* 1918. Oct. Vol. 53. pp. 376–377. [Received June, 1923.]

A case of rat-bite fever in Bombay resulting from a bite on the chest was successfully treated with injections of cacodylate of soda. In all, three subcutaneous injections (1·8, 2·4, and 3·0 grains) were given, on July 27, 29 and 31. The patient, who had a large sloughing ulcer at the site of the bite and swollen axillary glands together with fever and general ill health, rapidly improved. The ulcer had completely healed in a fortnight after the last injection. Dr. Row discovered the causative organism in the blood of guinea pigs inoculated from this case. Powell states that he had seen considerable improvement in other cases after the use of cacodylate of soda, which is much cheaper and more easily administered than salvarsan.
C. M. W.

SPAAR (Eric C.) **Two Cases of Rat-Bite Fever. Rapid Cure by the Intravenous Injection of Neosalvarsan.**—*Jl. Trop. Med. & Hyg.* 1923. July 16. Vol. 26. No. 14. pp. 239–243. With 2 charts in text. [13 refs.]

A record of two cases of rat-bite fever from Colombo.
C. M. W.

YELLOW FEVER.

HOUILLON & BAUVALLET. **Rapport sur l'épidémie de fièvre jaune à Grand-Bassam (18 août au 8 septembre 1922).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21, No. 1. pp. 42-52.

The importation from the Gold Coast of a case of yellow fever resulted in an outbreak in which five cases of the disease occurred at Bassam. Stringent sanitary measures were adopted and these prevented a further development of the epidemic. When the diagnosis was determined 140 Europeans out of a total of about 200 who resided there were given a dose of NOGUCHI's vaccine. Six days later 131 of these received a second dose. Of the five cases, all of which were treated with NOGUCHI's serum, three died. One of the residents who had received a single dose of vaccine was taken ill with fever and vomiting. The case was immediately treated with serum and a rapid recovery resulted. A guinea pig inoculated from one of the cases died on the seventh day. There was no marked jaundice of the skin but the muscles had a sub-icteric tinge. The lungs were markedly congested and the kidneys revealed small haemorrhagic areas. The urine in the bladder contained a large quantity of albumen. Facilities for discovering the leptospira were not available.

C. M. Wenyon.

STÉVENEL. **Spirochétose ressemblant cliniquement à la fièvre jaune observée dans la Haute Côte d'Ivoire.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 238—241.

The author describes a disease which exists in endemic form in the Ivory Coast and resembles yellow fever in many respects. He does not believe that it is Weil's disease, owing to the fact that he failed to infect guinea pigs with the urine of convalescent cases. An organism resembling NOGUCHI's *Leptospira icteroides* was discovered in the blood but owing to the fact that Stegomyia was either entirely absent or present in exceedingly small numbers in the localities where the cases occurred the author seems to think that some other vector must be responsible. A thorough investigation is required.

C. M. W.

GROVAS (Pedro Perez). **Serological Reactions in Yellow Fever.**—*Amer. Jl. Trop. Med.* 1923. July. Vol. 3. No. 4. pp. 325-334. [8 refs.]

The author has had an opportunity of investigating certain serological reactions in cases of yellow fever at Vera Cruz with a view to determining the earliest appearance of antibodies in the blood. Agglutination experiments were conducted by using cultures of *Leptospira icteroides* in the rabbit serum Ringer medium of MARTIN and PETTIT in which the organisms were uniformly distributed. The serum to be tested was diluted with 49 times its volume of isotonic salt solution and one part of this mixture was added to one part of the culture. The agglutination phenomenon, which was often accompanied by lysis, was observed by means of the dark-field microscope. The serum of 183 cases of yellow fever, together with serum from 17 cases of other diseases and 23 normal individuals, was tested, and it was found that the serum of yellow fever cases acquires definite and easily detected agglutinins by the beginning of the second week of the illness. The control sera gave uniformly negative results. The serum from recently vaccinated persons usually gave a positive result.

Pfeiffer's reaction was tested by inoculating guinea pigs intraperitoneally with a mixture of 0·25 cc. of serum and 2 cc. of culture. The peritoneal fluid was withdrawn by means of a pipette every half hour for two or three hours and examined with the dark field microscope. In positive cases no motile organisms were found at the end of one and a half to two hours. The result was constantly positive in the case of 17 convalescents from yellow fever. In one case tested on the eighth day of the illness the reaction was negative.

With the use of an antigen prepared from cultures of *Leptospira icteroides* in fluid media the complement fixation test gave unsatisfactory results. It appears to be subject to numerous sources of error which deprive it of all practical usefulness. On the other hand the ease with which the agglutination reaction is carried out, and its precision, makes it a suitable one for diagnostic purposes.

C. M. W.

VOMELA (Stanislav). **Ueber die Spirochaetenaetiologie der akuten Exantheme I. (Akute Exantheme und die Gelbfiebergruppe.)**—*Bibliothèque Microbiol. Tchéco-Slovaque.* 1923. T. 2. 14 pp. [10 refs.]

——. **Ueber die Spirochaetenaetiologie der akuten Exantheme II.**—*Ibid.* T. 3. 13 pp. With 3 charts.

In this discussion of the etiology of the various exanthemata the author expounds what appears to be a new point of view. He regards all these diseases, including yellow fever, Weil's disease, dengue and sand-fly fever, as fundamentally similar. Those in which the etiology is as yet unknown are connected with the yellow fever group by dengue and sand-fly fever. It is the author's belief that spirochaetes will be found to be the cause of all these diseases and that the various problematic structures which have been found associated with smallpox, scarlet fever, typhus and other diseases probably represent some stage in the development of spirochaetes. In order fully to appreciate the thesis it is necessary to read the article in its entirety.

C. M. W.

INFECTIOUS JAUNDICE.

SCHUEFFNER (W.) & SNIJDERS (E. P.). **A Case of Spirochaetosis icterohaemoglobinurica.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. p. 295. With 1 plate.

This paper is a short note on the case of blackwater fever showing numerous leptospira in the blood and organs, which was described more fully elsewhere (this *Bulletin*, Vol. 13, p. 300). The patient died in 24 hours in a condition typical of blackwater fever. A few benign tertian malarial parasites were found in the blood and in addition large numbers of spirochaetes—as many as 3·6 millions per cubic centimeter of blood. After death the organs, especially the kidneys, liver and spleen were found to be heavily infected. Guinea pigs inoculated intraperitoneally with 1 cc. of blood failed to become infected.

In this note no mention is made of any name for the spirochaete, but in the papers previously reviewed (*loc. cit.*) the name *Spirochaeta icterohaemoglobinurica* is suggested. In the English version which accompanies the second of these papers the name is spelt *Spirochaeta icterohaemoglobinuria,* while MESNIL, in his review in the *Bulletin de l'Institut Pasteur,* Vol. XVII, p. 296, gives it as *S. icterohemoglobinuriae,* and this is the form in which BLANCHARD and LEFROU, who claim to have discovered a similar organism, called by them *S. biliohemoglobinuriae,* in cases of blackwater fever in the Congo, refer to it (see this *Bulletin,* Vol. 20, pp. 138 and 202).

C. M. Wenyon.

VAN DE VELDE (E.). **Bloedspirochaeten bij Koortsen en Spirochaetosis ictero-haemorrhagica.** [Spirochaetes in Blood in Icterohaemorrhagic Spirochaetosis].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 169–203. With 5 charts and 13 figs. [19 refs.] [English summary, p. 204.]

Apart from the atypical case recorded by SCHÜFFNER (above), no cases of Weil's disease appear to have been reported in Asia outside Japan. The author now gives an account of four cases seen by him in Batavia. The diagnosis was confirmed by discovery of the organism in the blood and urine of the cases and by their successful culture and inoculation into guinea pigs.

C. M. W.

KOUWENAAR (W.). **Over een epidemie van koortsen zonder en met icterus, veroorzaakt door een Leptospira.** [On an Epidemic of Fever with and without Jaundice, caused by a Leptospira.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 225–233. With 11 charts. [1 ref.]

Kouwenaar reports on an epidemic (164 cases) of a fever which he assigns to the dengue group, though it shows few typical features. It was sometimes accompanied by nephritis (24 cases), sometimes by jaundice (21 cases). Nearly regularly there was albuminuria and a slight leucocytosis. From his hospital records the author demonstrates the endemicity of this desease in his area (tobacco estates). The endemic from time to time increases to small local epidemics.

The writer tested the urine sediment of 64 of his patients for the presence of leptospira, with positive results in 43 cases. Generally the parasites appeared on 1 or 2 days during the fall of the temperature and again for a few days from the 13th or 14th day of convalescence. Guinea pigs injected with urine containing leptospira or with a culture of the same guinea pigs died with symptoms exactly similar to those found in guinea pigs experimentally infected with Weil's disease.

Whether the disease under report is aetiologically identical with Weil's disease the author thinks can be decided only by immunologic methods.

W. J. Bais.

VANNI (V.). **Sulla morfologia e riproduzione della** *Spirochaeta icterohaemorragiae* **di Inada e Ido.**—*Policlinico.* Sez. Med. 1923. July 1. Vol. 30. No. 7. pp. 330–336. With 4 figs. [11 refs.]

The doctrine that spirochaetes are protozoa allied to the trypanosomes was first enunciated by SCHAUDINN. For a time many observers followed him in this view but careful investigations have shown it to be quite untenable so that in recent years it has been universally abandoned. The writer of the paper under review has studied *Leptospira icterohaemorrhagiae* both by dark ground illumination and by various staining methods and has convinced himself that the organisms have fundamentally the same structure as trypanosomes. The body is often dotted over with granules which have a certain affinity for stains. These are regarded as mucoid in nature. Apart from these there occur a terminal granule and a collection of central granules which are actually within the spirochaete. The former, the author states, he has observed to divide under the dark field, and as the two portions separate from one another longitudinal splitting of the spirochaete takes place till finally longitudinal division is completed. A figure is given comparing this division with that of a trypanosome. [The author's statements are very definite but in view of the fact that many competent observers who have made a special study of spirochaetal organisms have failed to observe what he describes, one hesitates to accept his conclusions without further and more convincing evidence. The appearance of terminal blepharoplast, central nucleus and longitudinal division are capable of other interpretations.]

C. M. W.

NOGUCHI (Hideyo). **Leptospiras, Pathogenic and Non-Pathogenic. Together with Some Observations on the Spirochetal Flora of Stagnant Fresh and Salt Water and the Mammalian Stomach.**—*New York State Jl. of Med.* 1922. Vol. 22. No. 9. pp. 426–427. With 5 plates. [1 ref.]

The paper, which is illustrated by a series of microphotographs, describes certain spiral organisms which the author has studied in water and in the gastric mucosa of various animals. Both fresh and salt water contain leptospiras indistinguishable from those producing disease in man. Owing to certain differences in size more than one species may be represented. Pure cultures of these have not been obtained and the organisms have not proved to be pathogenic to guinea pigs. [It may be noted that ZUELZER (this *Bulletin,* Vol. 20, p. 143) has shown that the cultures of one strain of a similar aquatic organism were pathogenic to guinea pigs]. Other spiral organisms of the *plicatilis, buccalis, refringens, macrodentium* and *microdentium* types were seen in water, as well as several spirilla and *Spirillum undulans* (*loc. cit.,* p. 129).

HOFFMANN in Germany found a small organism called by him *Leptospira dentium* in dental deposits of men but the author has been unable to find this organism in the human mouth. On the other hand he has found a small form (*L. bovis* n.sp.) in the gastric mucosa of the ox. A number of spirochaetes of the *microdentium* type were found in the stomach of the sheep, ox and cat by Dr. CROSS. The author's genus *Leptospira* is defined as including actively motile organisms which appear as delicate, flexible, tapering filaments, so clearly and regularly coiled as to resemble a rope with a tendency to bending of one or both ends. No terminal flagella have been demonstrated with satisfaction nor has the terminal granule which some authors describe been seen. In certain preparations stained by Miss TILDEN the appearance of numerous peritrichal flagella was obtained and in view of the characteristic movement it is not improbable that the organisms are provided with flagella. The leptospira resists the action of 10 per cent. saponin.

C. M. W.

i. PASSEY (R. D.) & RYLE (J. A.). *Leptospira icterohaemorrhagiae* **in Surrey Rats with Notes of a Probable Case of Spirochaetal Jaundice from the District.**—*Guy's Hosp. Repts.* 1923. Jan. Vol. 73. (Vol. 3. 4th Ser.). No. 1. pp. 31–36. With 2 charts. [11 refs.]

ii. KASAI (Katsuya). **[On Spirochaeta Icterohemorrhagia, Which was Demonstrated in the Mouse.]**—*Saikingaku Zasshi* (*Jl. of Bact.*) 1922. Dec. No. 327. [Summarized in *Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. p. 85.]

i. A case of what appears to be Weil's disease contracted in Guildford is described. The organism was not isolated from the case but an emulsion of the kidneys of three wild rats from this locality gave rise to infection in guinea pigs, and this fact, together with evidence obtained that the patient had been near a hen house which was overrun by rats, tends to support the diagnosis.

ii. A record of the isolation of *Spirochaeta icterohaemorrhagiae* from white rats in the Bacteriological Institute of Michigan University.

C. M. W.

REVIEW OF RECENT ARTICLES ON PELLAGRA.

As is usual in all papers dealing with the subject of pellagra, the question of aetiology holds first place. The present series of articles is no exception to this. It would appear that there is a tendency for the food deficiency hypothesis to be less completely satisfying than formerly, and even among its followers the rôle of protein deficiency, as opposed to all other forms of food deficiency, is not put forward in quite the same optimistic spirit.

Once again McNeal (1) pleads the case for the infection theory of the disease. An account is given of the work of the various pellagra commissions in America, the results of which have already been stated in this *Bulletin*. Attention is drawn to recent outbreaks, with particular reference to those in which doubt was thrown upon the adequacy of the food deficiency theory. It will be agreed, as McNeal points out, that it is remarkable, considering the terrible food conditions in certain European countries both during and after the war, that pellagra is so rare in these communities. The author concludes his article with the following arresting remarks: "If the intelligent use of sanitary privies will prevent the spread of this disease to new victims, then the means of its final eradication is in our hands. To me this appears already to be established as a fact. Indeed, one may perhaps be permitted to say that the study of pellagra has now reached a stage comparable to the study of yellow fever in 1900, a stage when only the advent of a bacteriological genius, such as Noguchi, will be required to identify the microbic cause of the disease." A most animated discussion followed, in which some of the most experienced observers of pellagra in America took part, and it is obvious from their remarks that the infection theory does not raise so much opposition as formerly.

The work of Jobling and Arnold (2) supports the infection theory. About the year 1910 four different observers, Hausmann, Lode, Horbaczewski and Raubitschek, independently, put forward the suggestion that pellagra might be a photodynamic intoxication. That such sensitization does occur is evidenced by the work of Meyer Betz, who, after he had inoculated himself with haematoporphyrin, found that the parts exposed to sunlight became covered with an erythematous rash with oedema. All the older experiments, however, were made with the object of discovering photodynamic substances in corn. Jobling and Arnold conducted their researches in Nashville and Memphis during the years 1919 to 1922 inclusive. The number of pellagra cases, however, diminished so rapidly that the authors were forced to discontinue their work and to give such results as had been so far obtained. Attempts were made in the first place to extract photodynamic substances from the urine and faeces of pellagrins but without success. Next, search was made in the faeces for fungi capable of producing such photodynamic substances. In time, with improved technique, positive results were obtained. The medium used was that advised by Currie (*Jl. Biol. Chem.* July 1917).

---

(1) MacNeal (W. J.). The Infectious Theory of Pellagra.—*Southern Med. Jl.* 1922. Nov. Vol. 15. No. 11. pp. 899–902. (Discussion, pp. 902–906.)

(2) Jobling (James W.) and Arnold (Lloyd). Observations and Reflections on the Etiology of Pellagra.—*Jl. Amer. Med. Assoc.* 1923. Feb. 10. Vol. 80. No. 6. pp. 365–368. With 3 figs. [22 refs.]

On this plate cultures were made and the colonies removed to test tubes containing Currie's medium to which had been added 3 per cent. Pot. Iodide, 1 per cent. starch, and 2 per cent. agar. When these tubes were placed in bright light, blue colonies, due to the formation of oxalic acid, appeared if photodynamic substances were present. In this way fluorescent cultures were produced and their effects studied. During the summers of 1921 and 1922, strains of fungi reacting in this way were isolated from the faeces in five of nine acute cases, in one of six subacute cases, and in two of twenty-three chronic cases. Fifty non-pellagrous persons were used as controls with negative results in every case. The fungus apparently belongs to the Aspergillus glaucus repens group. " When a series of mice was inoculated, those exposed to the light soon developed oedema and reddening of the ears, and swelling and oedema of the eyelids. In a few experiments death quickly followed exposure to sunlight. If the inoculations were continued daily, with repeated exposure to bright light, the ears became gangrenous and dropped off, the tail became rough and scaly, and there was some loss of hair from the face and head." Attempts were also made to infect the animals by feeding, but without success. Jobling and Arnold do not agree that in all pellagrous persons the diet has been insufficient in protein, but they do think that excess of carbohydrate has been consumed. Apparently the growth of these photodynamic fungi is inhibited by protein and increased by carbohydrate.

Babes (3) has also worked along the same lines as Jobling and Arnold. While admitting the harmful effect of the sun's rays upon white mice fed with maize, he does not think that exposure to light is the cause of pellagra. In man, intense exposure to sunlight produces only the skin manifestations of pellagra and these only in persons already suffering from the disease. That the presence or absence of pigment in the skin plays no part in the production of pellagrous symptoms he thinks is evidenced by the fact that many white domestic animals are fed upon maize without evil results and that the dark skin of the coloured races does not render them immune to pellagra, The pigment produced in the skin of pellagrins as a result of the disease does not act as a defensive mechanism against the sun's rays.

Let us now turn to the articles dealing with the food deficiency hypothesis. Hindhede (4) does not think that pellagra is due to the absence of protein in the diet, and he attempts to show that protein in potatoes, bread, meat and milk has the same biological value He bases his disagreement with the protein deficiency theory on statistics gained from an analysis of the diet of many countries, and upon human feeding experiments. As an example of the latter the following experiment is of interest: One of Hindhede's assistants lived for one year on potatoes and margarine ; for six months on whole rye bread, margarine, prunes, sugar and starch ; for six months on barley meal, porridge made with water, margarine and sugar ; for two years on bread, potatoes, cabbage soup and fruit soup without fat. The object of this heroism was to determine the protein and fat minimum. It is not stated whether the man is still alive. Hindhede states that " bran is one of our most valuable articles of nourishment," and that the Danish war rationing was largely based upon the value of this substance. " The question of pellagra is not a question of protein, but of vitamin " .

---

(3) Babes (V.). Observations sur les substances photodynamiques et le pigment, dans la pellagre.—*C. R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 916–919. [13 refs.]

(4) Hindhede (M.). Protein and Pellagra.—*Jl. Amer. Med. Assoc.* 1923. June 9. Vol. 80. No. 23. pp. 1685–1689. [22 refs.]

To this work of Hindhede, GOLDBERGER (5) makes answer. He states that lack of animal protein has not been suggested by himself or anybody else as the cause of pellagra. Thus, much of Hindhede's argument does not apply. " In view of our position with respect to animal protein, it must be obvious, if the problem were the simple alternative between animal protein and vitamin, as Hindhede seems to consider it, we should logically have to agree with him as to vitamin. . . . The matter is not so simple, for to us it is a question not of a lack of animal protein but of a faulty protein (amino-acid) supply."

GOLDBERGER (6), in a further paper, elaborates the theory that an amino-acid deficiency is the primary aetiological factor in pellagra. Six cases are quoted in which the disease developed in patients fed for three to four months upon a diet in which vitamins and mineral salts were fully represented.

In the opinion of DEEKS (7) excess of carbohydrate in the diet is as important as deficient protein as a cause of pellagra.

SHATTUCK (8) analysed the case histories of 144 pellagrins in the hope of discovering possible aetiological factors. Fifty-eight revealed nothing of importance. In the remaining 86 cases, chronic alcoholism was noted in 26, eccentricity of diet in 23, pre-existing mental disease in 13, debilitating influences in 19, and chronic wasting diseases in 5. In more than one-third of the 52 cases in males, there was evidence of chronic alcoholism. This does not mean necessarily that alcohol is the direct cause of the disease, for the well-known gastric disturbances, and the financial straits consequent upon chronic indulgence in this drug probably play a very important part.

SHATTUCK (9) also discusses pellagra in the state of Massachusetts. Apparently the first case was noted in 1864, but it was only in 1914 that pellagra was listed as a reportable disease. The maximum number of cases was in 1916 and this increase appears to have been due to high prices and scarcity of food. The following points are of interest: The disease apparently originates in the State itself because most of the cases were in native-born residents; the disease is most common where population is dense; women are more often affected than men; amongst women the majority were house workers and in males unskilled labourers; the skin lesions appear most often in July, but no month in the year is exempt.

---

(5) GOLDBERGER (Joseph). Protein and Pellagra. [Correspondence.]—*Jl. Amer. Med. Assoc.* 1923. June 23. Vol. 80. No. 25. pp. 1866–1867.

(6) —— & TANNER (W. F.). An Amino-Acid Deficiency as the Primary Etiologic Factor in Pellagra.—*Ibid.* 1922. Dec. 23. Vol. 79. No. 26. pp. 2132–2135. [4 refs.]

(7) DEEKS (W. E.). The Etiology and Treatment of Pellagra.—*Southern Med. Jl.* 1922. Nov. Vol. 15. No. 11. pp. 891–898.

(8) SHATTUCK (George Cheever). Pellagra in Massachusetts.—*Boston Med. & Surg. Jl.* 1923. Jan. 25. Vol. 188. No. 4. pp. 110–115. [22 refs.]

(9) ——. Factors apparently influencing the Development of Pellagra in Massachusetts. *Ibid.* June 7. No. 23. pp. 889–891. [2 refs.]

The disease in Ontario is discussed by STEVENSON (10). The first case in this province was reported in 1914, while in the period 1913 to 1922, inclusive, 30 deaths from pellagra have been recorded. The figures show that of 28 of these cases 21 were women and seven men and none children. Two further cases which ended fatally are described. In one of these the fungus of JOBLING and ARNOLD (2) was looked for but without result.

In Berlin, at the Charité Hospital, 10 cases have been described by VON BONHOEFFER (11). Six of these were apparently true pellagra, but it is disquieting to note that they also had subcutaneous haemorrhages and bleeding gums. Five of these ended fatally. Mental symptoms were very common. The rash appeared between February and October. Deficient diet seems to have been the most important aetiological factor, and maize can be definitely excluded.

Pires DE LIMA (12) contributes a review on pellagra in Portugal. The main value of this, as the author himself states, is to supply a bibliography dealing with articles published only in obscure local journals.

Before the Dermatological Section of the Royal Society of Medicine in London, STANNUS (13) showed a case of possible pellagra occurring in a British store-keeper in West Africa. The rash appeared for the first time about four months after his arrival in the country. Except for the skin condition, the diagnosis was extremely problematical.

As regards clinical work on pellagra, very few new observations appear. Mention must be made, however, of a paper by HUCK (14) dealing with the blood picture. "In all stages of uncomplicated pellagra, the blood picture shows a secondary type of anaemia with a normal leucocyte count. The differential formula shows an increase in lymphoid elements when the symptoms are severe. When the symptoms have subsided, and the patient is in the convalescent stage, the polymorphonuclear eosinophils are increased. The platelet counts are normal." The stools were also examined and it was found that neither intestinal parasites nor skin lesions play any part in the eosinophilia, and that this was indicative of a good prognosis. A very full bibliography is given.

A. Douglas Bigland.

---

(10) STEVENSON (G. H.). Pellagra in Ontario with Report of Two Cases. —*Canadian Med. Assoc. Jl.* 1923. July. Vol. 13. No. 7. pp. 504-507. [10 refs.]

(11) VON BONHOEFFER (K.). Unterernährungspsychosen von Pellagratypus.—*Deut. Med. Woch.* 1923. June 8 Vol. 49. No. 23. pp. 741–745.

(12) PIRES DE LIMA (J. A.). La Pellagre en Portugal. (Revue Critique.)—Reprinted from *Med. Moderna.* 1923. No. 354. 10 pp.

(13) STANNUS (Hugh S.). Case of (?) Pellagra.—*Proc. Roy. Soc. Med.* (Sect. of Dermat.). 1923. Jan. Vol. 16. No. 3. pp. 27–28.

(14) HUCK (John G.). The Blood Picture of Uncomplicated Pellagra with a Review of the Literature.—*Bull. Johns Hopkins Hosp.* 1923. May. Vol. 34. No. 387. pp. 157–164. [29 refs.]

MISCELLANEOUS.

O'CONNOR (Francis W.). **Researches in the Western Pacific. Being a Report on the Results of the Expedition sent from the London School of Tropical Medicine to the Ellice, Tokelau, and Samoan Islands in 1921–22.**—*Research Memoirs of the London School of Tropical Medicine.* 1923. Vol. 4. pp. iv+57+ii. With 8 plates. [Price 4*s*.]

A preliminary account of this expedition was published in the *Transactions of the Royal Society of Tropical Medicine and Hygiene* [see this *Bulletin,* Vol. 20, p. 5]. The author was engaged for 17 months in actual scientific investigation, during which he surveyed 20 islands in the Samoan, Tokelau, and Ellice groups. The geography, topography and climate of these are described. Thus, the Samoan group consists of eight [four are American] inhabited islands of volcanic origin, of which Savaii reaches an elevation of 4,000 feet; the Samoans live on the low-lying coast country close to streams and plantations. The Tokelau and Ellice groups are atolls and not more than 20 feet above sea level. The customs and habits of the islanders are considered. The diseases prevalent are ankylostomiasis, filariasis, yaws, tuberculosis and skin affections, especially Tinea imbricata. In Samoa eye diseases are common and leprosy is not rare. In the Southern Ellice fish poisoning occurs.

The author first makes some general observations on the three groups and then treats each individually. Of the general blood picture it may be said that the leucocyte count is usually higher in natives than in Europeans, counts of 9,000–10,000 being common. The eosinophile count was usually above normal and averaged 20 in three children of five and under whose only parasite was Trichuris; observations of Europeans showed that filariasis alone can raise the percentage. Considering the heavy weight of hookworm infection the haemoglobin percentage was not remarkably low.

Filariasis.—Epidemiological and experimental evidence confirmed *Stegomyia pseudoscutellaris* as the intermediate host (BAHR, Fiji, 1910). Thus, in the Tokelaus, where filariasis is indigenous, this is the only mosquito and elsewhere the incidence of filaria increased with that of *S. pseudoscutellaris.* Mosquitoes of this species hatched from larvae and fed on filariated subjects were found after an interval to contain fully developed larvae in head and proboscis and similar findings are recorded in seven specimens of 100 caught wild. An account is given of the development in the mosquito. It bites by day and breeds in fresh water containing decaying vegetable matter—in husks and shells of coconuts, holes in trees whether artificial or natural, bottles and tins, depressions in the larval rock (Samoa), cocoa pods which have been excavated by a rat. Measures for its control would not be difficult; indeed the author suppressed it in one islet in two days.

Observations on the microfilaria, which is non-periodic, are given. The author found (a) that microfilarial incidence is in direct relation to the prevalence of *S. pseudoscutellaris,* (b) that the incidence of clinical filariasis is in direct relation to the microfilarial incidence, and (c) that elephantiasis is usually prevalent where clinical filariasis is greatest. Children below the age of four rarely show undoubted signs of filarial infection. The author's observations support the opinion generally held that elephantiasis is a manifestation of filarial infection.

The clinical signs of filariasis are discussed and especially the early signs, for Dr. O'Connor's assistant, Mr. C. E. **Berry**, became accidentally infected. Two days after the infective bites (in April) several hard, brawny, extremely itchy bites, each about the size of a shilling, were noted ; on the 43rd day the epitrochlear gland was swollen and tender and was removed on the 71st ; on the 156th day there was a severe attack of lymphangitis lasting a fortnight, beginning with pain and swelling of the axillary glands ; on Nov. 11th the eosinophile count was 12 per cent ; on the 254th day there was tenderness and slight swelling of the epididymis ; on March 1st the eosinophile count was 16 per cent. These are the salient features of the case. The removed gland showed haemorrhages and large clusters of eosinophiles ; no worms.

Cases (one to six in each instance) were treated with salvarsan, novarsenobillon, galyl, kharsivan, tartar emetic, stibenyl, collosols of copper, selenium and manganese, quinine hydrochloride and emetine—without effect on the microfilariae. Symptoms were sometimes mitigated by the bodily rest.

Other Diseases.—Of helminths three species of hookworm were found, *Necator americanus* being the commonest ; *Ascaris lumbricoides* (in Samoa) and *Trichuris trichiura* ; no cestodes or trematodes. Ankylostomiasis is serious. "Ova were found in every case of filariasis brought in for treatment" ; over 90 per cent. must be infected. Latrines staged over the sea is the obvious preventive. Tuberculosis, "the scourge of the Pacific," is prevalent in every island. In young children fatal tuberculous peritonitis is very common, in older children tuberculous neck glands, and in adults phthisis. The customs of the people lead to the simultaneous infection of entire families. Yaws is common—manifested by cracked feet, granulomata, onychia ; in a few instances deformity of the tibia. Juxta-articular swellings with past history of yaws occurred in all the islands. Gonorrhoea was not observed and syphilis, "if it exists at all, cannot be common." [Cf. this *Bulletin,* Vol. 20, p. 179.]

Particular aspects of disease in each group are next considered and must be dealt with briefly. The filarial incidence for each island was worked out and correlated with the incidence of the Stegomyia. In the *Ellice* of 1,169 persons above 16 years 716, or 61·2 per cent., showed evidence of infection, either microfilarial or clinical (including elephantiasis) ; of the last 120 cases were seen. The absence of ascariasis in this group is attributed to the sweet husk of a coconut which the Ellicians are accustomed to chew ; two infested Samoans lost their worms after several months in the Ellice. Ankylostomiasis affects probably 100 per cent. of adults, and to this in part it attributed the appalling susceptibility to tuberculosis. The whip-worm is extremely common. Cysts of *E. histolytica* were found in 1·3 per cent. of 225 examined but there is no tradition of amoebic dysentery. Balantidium was found neither in man nor pig in this group, possibly again due to the coconut. Interesting information is given about fish poisoning on some of the southern atolls ; rock haunting fishes of certain species taken in a particular locality are toxic to the eater, but there was no opportunity to verify the native statements.

In the *Tokelau* group the inhabited islets are so small that they are completely cultivated and no cover is left for mosquitoes ; the uninhabited islets shelter the Stegomyia. The filarial incidence was 36·7 per cent. (330 examined). Details are furnished for 3 islets. No case of elephantiasis was seen or reported.

In *Samoa* of 2,509 persons past their 16th year 1,463, or 58·3 per cent., showed evidence of filarial infestation: 115 cases of elephantiasis were seen. Enlarged epitrochlean glands were found in a large proportion of children in two schools. The ankylostome percentage was 85·1. *E. histolytica* was found in 9·6 per cent. (229 examined); 2 cases of amoebic dysentery were seen in Chinese. Three epidemics of Samoan conjunctivitis occurred during the author's stay; in default of proper treatment it is followed by ulceration of the cornea; it resembles gonorrhoeal ophthalmia and LEBER has described a diplococcus as the cause. Gonorrhoea seems to be excessively rare.

Part III consists of an account of parasites found in animals, of the life-history and habits of *Stegomyia pseudoscutellaris* and of *Finlaya kochi*, an aggressive mosquito in Samoa. *S. pseudoscutellaris* is most prevalent in densely shaded parts of the bush and in houses of European construction, but is rarely found in the top storey of two-storeyed buildings. At the grave of R. L. Stevenson, 1,500 feet above the sea, it is a great pest.

The Report is nicely illustrated and is a model of arrangement and lucidity.

A. G. B.

MADRAS. **Reports on the Working of the King Institute of Preventive Medicine, Guindy, for the Official Year 1921–22 and the Micro-Biological Section for the Period from 1st January to 31st March, 1921** [CUNNINGHAM (J.), Major, I.M.S., Director.]—pp. 30+3. 1923. Madras: Supt. Govt. Press. [Price 10 annas.]

An attempt was made for the first time to show the earning capacity of the King Institute as well as the cost of upkeep. By calculating vaccine at one anna per case and estimating bacterial vaccines and various examinations at the sanctioned Government rate it is shown that the Vaccine section made a profit of Rs. 42,875 on the year's working and the Microbiological section one of Rs. 67,425.

There was a greatly increased demand for prophylactic cholera and T.A.B. vaccines but even so the amount of cholera vaccine used in the Presidency is very small considering the size of the population and the fatality of the disease. For the Widal test 813 specimens were received and tested for the three organisms of the enterica group and *M. melitensis*. Seeing that 457 were negative, if one may assume that malaria had been eliminated, the percentage of cases of unclassed fevers must be high in the Presidency.

Specimens were received from 34 suspected cases of diphtheria; 11 gave positive results, 7 from Europeans and 4 from Indians; there was a definite outbreak among European soldiers. In six instances a smear from the throat was the only specimen forwarded; all were negative but positive cultures were afterwards obtained from three of these cases. The importance of obtaining such cultures as early as possible is stressed.

Of specimens of cerebrospinal fluid taken from 22 cases with meningeal symptoms the meningococcus was found on culture in five and a pneumococcus in four. The pneumococci were found on the first examination, the meningococci once only on the first, in three cases on the second, and once postmortem. Repeated examinations should therefore be made if the first is negative.

Some account of the Vaccine section will be given elsewhere.

A. G. B.

CHOISSER (R. M.). **The Hygienic Laboratory of the Republic of Haiti.**—*U.S. Nav. Med. Bull.* 1923. Jan. Vol. 18. No. 1. pp. 56–61.

The laboratory was established by means of an appropriation of 2,000 dollars from the Department of State in Haiti in November 1921 in two rooms of the City Hospital at Port au Prince and the author, of the U.S. Navy, was placed in charge. Specimens began to come in at once, in many instances, owing to the defective communications, by aeroplane. The examination of sputum showed tuberculosis to be a common affection ; the disease is very fatal. Of intestinal parasites ova of ascaris and trichuris are common. No cestode eggs have been seen nor any ankylostoma. This infection does exist in the northern part and is common in the adjoining Dominican Republic. Typhoid fever, plague and yellow fever are unknown ; *S. fasciata* is very common. *Entamoeba histolytica* has not yet been isolated ; dysentery is severe at times. Malaria is very prevalent ; of 285 smears examined 65 were positive, all three forms being represented. Filaria infection and elephantiasis are quite common. Syphilis is unusually prevalent ; a Wassermann is done on all patients admitted to the General Hospital ; of 771 tests 549 or 71·2 per cent. have been positive. OSLER states that Haiti furnished the first historical evidence of luetic infection. It is rare to meet with tabes or paresis. A case of rabies in a boy was seen and Negri bodies demonstrated.

[Neither yaws nor leprosy is mentioned.] A. G. B.

BERNARD (Noël). **Rapport sur le fonctionnement des divers services de l'Institut Pasteur de Saigon en 1921 (Extraits).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21. No. 1. pp. 81–92.

In the rabies section 452 persons were treated, a larger number by 50 than in any previous year, about half in Saigon and its vicinity. A table of cases from 1908 onwards shows a large and progressive increase in the last seven years. Energetic measures have been taken for the destruction of errant dogs. A table gives the bacteriological analyses. Of 34 positive blood cultures, in 16 Eberth's bacillus was found, and in 10 the *Bacillus asthenogenes.* Of 77 positive malarial slides in two-thirds the parasite was *P. vivax* and in one-third *P. falciparum.* The diphtheria bacillus was recognized in 50 cases. Hansen's bacillus was found in 27 suspects of leprosy. A suspicion that of uncertified deaths plague was probably a frequent cause led to the examination of the bodies of 214 children and 9 adults. The plague bacillus was found in five adults but in none of the children. The vaccine laboratory put out 2,650,630 doses of Jennerian vaccine, which necessitated the employment of 256 buffalos and 75 rabbits. At the Institute itself this gave 95–99 per cent. successes, but for various well-known reasons a smaller success rate in the districts. The section on animal microbiology will be treated elsewhere. A. G. B.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH. **Annual Report for the Year ended December, 1922.** [WATKINS-PITCHFORD (Wilfred), Director.] 48 pp. With 2 plates. 1923. Johannesburg. Published by the South African Institute for Medical Research, P.O. Box 1,038.

Research Division.—Of 48 strains of the Meningococcus obtained from the cerebrospinal fluid of three Europeans and 45 natives 13 were of Gordon's Type I, six of Type III, and 29 aberrant, indicating a rise in the incidence of infections due to aberrant strains* which complicates the production of efficient anti-meningococcal serum. A method for preserving the meningococcus alive for transmission abroad consists in "planting the whole of a twenty-four hour growth of Meningococci from a blood-agar slant into a tube of heated ('chocolate') human-blood-agar whilst the latter is still liquid at a temperature of 40° C. In thirty-six hours a profuse growth has occurred which, however, does not take the form of colonies visible to the naked eye." After the inoculation of 24 natives with meningococcal vaccine no trace of agglutinins could be detected in their serum, but it is allowed that some immunity may have been produced. The method for preserving the pneumococcus in a viable condition—growth in defibrinated rabbit's blood, desiccation in vacuo, and preservation in glass tubes in vacuo—has proved its worth.

Clonorchis sinensis was found in a Chinaman dying in Johannesburg. Seeing that the fresh-water snail, *Bithynia*, and fresh-water Cyprinodont fish, the intermediate hosts, occur in South Africa, Clonorchis might establish itself in the Union. The results of freezing on the vitality of tapeworm cysts have been given [this *Bulletin*, Vol. 20, p. 625]. The conclusion is that when a carcass is heavily infested it should not be used for human food, even after freezing for 12 weeks.

Routine Division.—As before, amoebic dysentery was much more prevalent than bacillary, two cases only of which were encountered. Examinations for enteric fevers more than doubled, for the joint reasons that the disease was more prevalent, there were several hunts for carriers, and the practice in suspected typhus is to have both Widal and Weil-Felix tests made. There are still a number of cases of enteric which fail to develop agglutinins, but all is not enteric that is so labelled.

To illustrate the difficulty of eradicating benign tertian it is stated that the parasite was found in 44 out of 500 ex-soldiers, nearly all of whom were infected four years back and had undergone long courses of treatment. There were 24 positive findings of undulant fever; the difficulty in diagnosing chronic cases is touched on. Epidemic cerebrospinal meningitis being prevalent on the rand from June to September, 927 examinations (C.S.F. or naso-pharyngeal swabbings) were made: 357 cases were found to be meningococcal and 17 pneumococcal. The supply of antimeningococcal serum temporarily ran out; serum was imported but, perhaps owing to deterioration in transit, the therapeutic action was practically nil, whereas the local serum gave good results.

Routine examinations for schistosome ova showed their presence in 226 patients; in all but two these were *S. haemotobium;* in one sample of faeces *S. mansoni* was detected, and in one urine *S. spindalis.* In post-mortem material evidence of bilharziasis was found seven times in the liver, once in the kidneys, and in a number of lungs. The microscope shows a fine diffuse interstitial fibrosis throughout the lung which might influence the course of a pneumonia. Nineteen further cases of primary carcinoma of the liver have come under notice; schistosome ova were found in six, in one *Clonorchis sinensis* and in one

---

* In the review of the Report for 1921 [this *Bulletin*, Vol. 20, p. 511], para 3, lines 2 and 3; for "3 with Gordon's Type II" read "3 with Gordon's Type III."

Cysticercus cellulosae. It is concluded that " toxins " from the parasites would explain the cirrhosis which precedes the malignant disease.

Of 870 Weil-Felix tests 170 were positive. The position as regards the value of this reaction is unchanged [this *Bulletin*, Vol. 20, p. 512.] No local strain of *B. proteus X 19* has yet been obtained.

Several cases of a hitherto undescribed disease have been met with. It is called pseudo-tuberculosis and there is a suggestion that it has some relation to acute splenic abscess of WALLACE [*op. cit.*, Vol. 19, p. 616].

A. G. B.

MEDICAL JOURNAL OF SOUTH AFRICA. 1922. Nov. Vol. 18. No. 4. pp. 104–105. [**Meeting of Witwatersrand Branch of the British Medical Association.**]

Four specimens of "pseudo-tuberculosis,"—two acute, two chronic—were shown by [?] Dr. J. H. Harvey PIRIE. The chronic cases—natives—showed abscesses (*a*) in liver and spleen, (*b*) in spleen.

Acute cases : (1) European miner, on September 3 complained of painful frequent micturition and haematuria. No history of venereal disease, bilharziasis or haemophilia. Temperature rose to 102° and patient died on September 13, " like a case of septicaemia." The liver was dotted with large white spots suggestive of early tuberculous lesions. Spleen large. Pelvis of right kidney distended with blood clot. Petechiae in mucosa of bladder. Histologically, lesions in liver resemble acute tubercles but no organisms found save some bipolar staining bacilli.

(2) A native, who died on the 2nd or 3rd day with haematuria and jaundice. Tubercle-like structures in spleen. Small bacilli found, some bipolar, staining with iron haematoxylin. Inoculation of guineapigs negative.

A. G. B.

AUDIBERT. **Les maladies endémo-épidémiques observées en Indochine pendant l'année 1921 (Extrait du Rapport annuel).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21. No. 1. pp. 61–75.

The chief sanitary officers throughout the Indo-Chinese Union are unanimous in attributing to *malaria* the most important part in the morbidity and mortality of Indo-China. It diminishes the birth-rate and is the cause of many abortions. In Cochin-China careful enquiry showed that 3 per cent. of pregnancies were cut short by malaria. The population is feeble, unfit for work, hence poor ; and malaria " makes the bed for other diseases." To give some particulars, 13,800 patients were treated, of whom 1,160 died, and 230 cases of blackwater fever with 25 deaths. In Cochin-China, a delta country, malaria formed one-seventh of the total hospital admissions ; two-thirds of the cases were benign tertian ; pernicious attacks and blackwater were rare. In the high country of Annam and Laos pernicious attacks and blackwater are frequent [the type of malaria is not given]. The methods of controlling malaria are detailed. Education and the willing consent of the natives to measures found necessary are an essential part. Persons licensed to sell alcohol and opium have to sell quinine as well at rates fixed by the local authorities. In this year 1,639 kilos were sold, or given away to authorized poor.

Cholera was this year more prevalent, especially in Cochin-China, where there were 2,206 cases. They were scattered and nowhere formed a true focus. Vaccination gave good results and was readily accepted; it is now obligatory wherever epidemic conditions are declared; 127,000 persons were vaccinated, against 44,000 in the previous year.

Of *plague* there were 1,118 cases and 971 deaths, larger figures than in the two preceding years. The most important focus was Pnom-Penh, the capital of Cambodia, where it is stated improved sanitary conditions are necessary as well as anti-rat measures and vaccination. Vaccinations numbered 45,000.

Small-pox is on the decrease. Infants are readily brought for vaccination but adults will not be troubled. Almost all the cases are among adults; 2,319,000 vaccinations were done with lymph furnished by three Institutes in the Union.

Leprosy is spread almost uniformly through the country. In Tonkin 3,300 lepers are known, two-thirds of whom are distributed in five leproseries. Another 3,000 are in Cochin-China. A native remedy, the composition of which is imperfectly known, has been tried with a considerable degree of success.

There were 1,609 cases of *beriberi* (three-quarters in Cochin-China), and 264 deaths. BERNARD, Director of the Pasteur Institute at Saigon, says that these cases begin with a febrile attack, which he believes to be of intestinal origin, due to an organism which he has called *Bacillus asthenogenes.* It can be isolated from the blood and inoculated to pigs [see this *Bulletin*, Vol. 19, p. 755]. Treatment consists, apart from a free supply of vitamins, in the progressive, discontinuous intramuscular use of strychnine in high doses. Details are given and the results in 26 cases; 1,500 such injections had been given.

Of *dysentery* 2,155 cases were declared, with 29 deaths. "Amoebae" were found 164 times, flagellates and spirilla about the same number each, dysentery bacilli 31 times. In Annam liver abscess is common in the native, rarer every year in the European.

Tuberculosis is wide-spread; 2,275 cases and 559 deaths were registered. All forms are seen. All the conditions are found for its dissemination both amongst the poor and among the native clerks.

Venereal diseases, after malaria, cause most sickness; 5,415 cases of syphilis were seen at the medical centres.

Other diseases noted were cerebrospinal meningitis 142 cases, and diphtheria 46, half in natives, half in Europeans, all of whom recovered.

A. G. B.

BENTMANN (Eugen) with HILTMANN (Eduard) & KÖHLER (Otto). **Kriegsärztliche Erfahrungen in Anatolien.** [Experiences of an Army Doctor in Anatolia.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Vol. 27. Beihefte. No. 1. pp. 1–135. With 18 figs., 1 chart and 4 sketch maps. [47 refs.]

This supplementary number contains an account of the doings of a travelling field-laboratory in a part of Asia Minor during the latter years of the war: we get from it some idea of the prevalent diseases of the provinces of Angora and Taurus, since the material examined and the general observations recorded were furnished not only from Turkish soldiers and recruits but also from the local populations.

In Angora, where over 10,000 investigations were made, the laboratory worked for more than seven months, from December, 1916, to July, 1917. The following is a summary of the diseases verified: Typhus, 549 cases—mortality 51·4 per cent., largest number of cases (175) in January. Relapsing fever, 280 cases—mortality 32·5 per cent. Cholera, height of epidemic in February, when the vibrio was found in 52 cases. Typhoid groups, of 382 stools examined for typhoid and dysentery the bacillus was found in only five cases of typhoid and one case of paratyphoid A. Dysentery, of the 382 stools examined the Flexner bacillus was found only in seven and the Y bacillus only in three: only two cases of amoebic dysentery were diagnosed. Malaria, in 3,931 blood examinations among troops, parasites were found in 143 cases; and in 1,702 examinations among the civilians only 23 were positive, namely 15 quartan, seven benign tertian, and one malignant tertian. Phlebotomus fever, two cases, in June and July: *P. papatasii* was the species observed. Tuberculosis, 14 cases of pulmonary tuberculosis, 15 of catarrh of apex, five of tuberculous pleurisy, 31 cases of scrofulous glands, 25 cases of surgical tuberculosis. Gonorrhoea, 12 cases. Syphilis, six cases and two cases of inherited syphilis. Among children a very few cases of diphtheria, hooping-cough, mumps, and measles were diagnosed. Tetanus, epidemic meningitis, and leprosy were not observed, and smallpox was known only through civilian statistics. About one-fourth of the 233 cases of eye disease were trachoma, and next in frequency came scrofulous forms of conjunctivitis and keratitis. More than one-third of the 146 cases of diseases of ear, throat and nose were chronic otitis media. Diseases of children were chiefly scrofulous. Of skin diseases (140 cases) nearly half were eczema and nearly a quarter itch. Of 413 examinations of stools for evidence of worms 199 were positive; and the species found were as follows, in percentage of stools examined: *Ascaris lumbricoides*, 43; *Trichocephalus*, 20·8; *Taenia saginata*, 6; *Hymenolepis nana*, 0·96; *Oxyuris vermicularis*, 0·48; *Strongyloides stercoralis*, 0·24. One case of hydatids of liver was observed.

The laboratory was busy in the Taurus for about a year, from August, 1917, to July, 1918. The following is a summary of the diseases diagnosed: Typhus, 156 cases, the highest number (46) being in April. Relapsing fever, 244 cases, the maximum (60) in April also; the mortality was 7·8 per cent. Malaria, 2,798 cases, the largest number (518) in October, the lowest (46) in June. Dysenteries of various kinds, 202; the Shiga and Y bacillus were verified three times each and the Flexner once; eight cases were amoebic. Typhoid groups, 10 cases; verified by serum tests. Cholera, 7 cases. Smallpox, 3. Mumps, 25. Measles, 1. Epidemic meningitis, 1. Erysipelas, 31. Influenza, 70. Tuberculosis, 23. Tetanus, 2. Diphtheria, 1. Malaria is said to be nearly as common as syphilis here. Parasites were found in 1,733 of the 2,798 reported cases, the benign tertian in 421, the quartan in 10, and the malignant tertian in 1,252, while in 32 cases the infection was mixed, and in 18 the species was not determined. The carriers observed were *Anopheles maculipennis* and *A. superpictus*, the latter being more than twice as abundant as the former. The malaria of the mountains is a much more serious disease than that of the plains. Many clinical varieties of malignant tertian were observed and the death-rate was considerable, being much higher (6·8 per cent.) among Turks than mong Germans (0·5 per cent.).

The introduction contains some good illustrations of this travelling field laboratory, and some zoological contributions are given in an appendix. [See also this *Bulletin*, Vol. 19, pp. 609–11.]

A. Alcock.

CANTLIE (N.). **Description of the Diseases of Mongalla.**—*Jl. Trop. Med. & Hyg.* 1923. Feb. 1. Vol. 26. No. 3. pp. 35–45. With 3 text figs.

The diseases described or mentioned, set down in order of importance, are—smallpox, yaws, gonorrhoea, soft sore, phimosis, tropical ulcer, leprosy, guinea worm, rectal bilharziasis, quinine haemoglobinuria, blackwater fever, intestinal worms, sleeping sickness, dysentery, filariasis, myiasis, skin diseases, juxta-articular nodules, gangosa, bronchial spirochaetosis, pneumonia, eye diseases, boomerang bones, myositis purulenta tropica, Banti's disease. Malaria is not mentioned except incidentally.

Smallpox is difficult to control because the vaccine supplied, in powder form, is often ineffective, the natives are averse to vaccination and the villages inaccessible : means of overcoming these difficulties are suggested. A long description of yaws is based on CHALMERS and CASTELLANI's account. It is extremely common. The author has never seen a case of syphilis in a native of Mongalla. From the examination of nearly 20,000 natives the incidence of leprosy is estimated at 1 per 1,000 ; nodular and anaesthetic and mixed cases are seen. In regard to guinea worm the author thinks that the interval between infection and the worm's piercing the skin varies with the opportunities for extrusion of larvae, and seems to think that under dry conditions the worm never appears ! Three cases of rectal bilharziasis were seen, all in natives who had never left Mongalla. Symptoms disappeared in two after treatment with antimony tartrate and in one after thymol ; the last was well and doing his work as servant a year later.

The author saw eight cases of "quinine haemoglobinuria" and briefly describes three. All were malarial natives from the north—none local. One patient had a relapse after swallowing 5 grs. of quinine bisulphate. A ninth case, in a European who died with jaundice and suppression of urine, is described as blackwater fever, but the author adds that he regards it as an aggravated case of quinine haemoglobinuria and does not consider blackwater fever to be a separate entity.

Amoebic dysentery is said to be uncommon but to exist in the cattle districts ; no mention is made of microscopical examination. It is treated with emetine and small doses of mag. sulph. Bacillary dysentery also is said to occur. Varicose lymphatic glands and elephantiasis are apparently attributed to the presence of *Filaria perstans*. A swollen and ulcerated condition of the foot and ankle is attributed to blastomycosis. Madura foot, Oriental sore and granuloma inguinale are said not to occur. Though bronchial spirochaetosis is described the author says he was never able to find spirochaetes in the sputum.

Under eye diseases pannus is mentioned but the author has not met with trachoma in natives of Mongalla. The condition described as boomerang bones affects the tibia, fibula, radius and sternum [see CHRISTOPHERSON, this *Bulletin*, Vol. 16, p. 219]. The cause is unknown. It is not stated whether the spleen was punctured in the two cases seen of Banti's disease. Antimony was given (dosage not stated) but without effect.

A. G. B.

MINETT (E. P.). **Preliminary Training for the Colonial Medical Services.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 1. Vol. 26. No. 1. pp. 5–6.

General opinion would confirm the statement, Dr. Minett thinks, that the medical officer has to learn a portion of his work after appointment. He himself, when appointed Bacteriologist to British Guiana, found that he was expected to perform the functions of pathologist, entomologist and public health laboratory worker. He outlines the training he would suggest for general medical officers and specialist medical officers.

The former he would require, after registration, to hold a house appointment at a recognised general hospital for six months, take a course at a school of tropical medicine and obtain the examination certificate. Medical officers on leave should receive extra leave on full pay to attend courses in special subjects.

The specialist medical officer (1) should hold a post-graduate appointment at a general hospital in pathology or bacteriology for one year, or a similar period as assistant to a whole-time medical officer of health, (2) join a school of tropical medicine for two years, during which he would be employed as demonstrator, and hold in succession assistantships in the departments of tropical pathology, sanitation, helminthology, protozoology, bacteriology and entomology for three months each, (3) take the diplomas of D.P.H. and D.T.M. The Colonial Secretary might be asked to appoint two men annually for training on these lines, for the expenses of which small sums might be collected from Colonial Governments and such large industrial interests as would have occasion to employ them. The trainees would receive £200–£300 per annum and board during the courses, subject to satisfactory reports of their progress.

Both classes of officers would be given seniority for pay and pension according to the length of the training.

[There will be general agreement on the advantages, both to the medical officer and his colony or sphere of work, of such a scheme, which will become practical politics when the colonial medical services become the colonial medical service, but even the Admirable Crichtons that may be expected to result will have much to learn when they reach the outposts.]

A. G. B.

D'ANFREVILLE DE LA SALLE (L.). **Projet de colonisation indigène et de stabilisation des populations locales.**—*Rev. Méd. et Hyg. Trop.* 1923. Jan.–Feb. Vol. 15. No. 1. pp. 23–27.

The author emphasizes the need of weaning the Moroccans from nomadism and attaching them to the soil. Large areas of the country are occupied by dwarf palms, which seriously interfere with cultivation. An industrial stage in which the palms are treated would precede the stage of cultivation, and he details the methods by which he would accomplish these ends and at the same time those of hygiene.

A. G. B.

CAZANOVE (M.). **Considérations médicales sur la Syrie et le Liban.**—*Presse Méd.* 1923. Jan. 24. Vol. 31. No. 7. pp. 125–133. With 1 map in text.

Syria is divided by nature into three zones, a coastal, a mountainous —consisting of the Libanus and Anti-Libanus ranges and the valley between—and a desert zone, each with a different climate, the character of which is described.

Of diseases *plague* is common and is usually seen at Beyrouth, Tripoli and Alexandretta; its occurrence is sporadic but small epidemics occur. Rats abound, as do food and shelter, so that there is little prospect of reducing their numbers.

Smallpox is prevalent. Since the French occupied Syria they have founded a vaccine institute at Beyrouth and have improved another at Damascus.

Measles is serious, causing a 10 per cent. mortality in a recent epidemic; *scarlet fever* is extremely rare.

Malaria is met with chiefly at Damascus, Alexandretta and in the bend of the Orontes river; the favourable breeding conditions for Anopheles in these places are described. The splenic index of the Syrian population is now under examination.

Enteric fevers are endemic. The whole population uses polluted water and dust abounds; paratyphoid A is frequent.

Amoebic dysentery is endemic but liver abscess is rare: bacillary dysentery is seen frequently in the European contingents of the army. Phlebotomus or *three-day-fever* appears with the sand-flies.

In two leproseries at Damascus, one, it is reputed, on the site of the house of Naaman the Syrian, 13 *lepers* were found in 1921. Damascus has the reputation of cutting the disease short. Two had been there 40 years, one 30 years, one 18, one 12, one 10 years and in all the disease appeared to be arrested. No medical treatment has ever been undertaken. In a place near Alexandretta were found eight lepers in three families, but leprosy in Syria, generally speaking, is rare as well as mild.

As to the diseases of the Syrian population they can only be inferred from the death certificates in the towns. At Beyrouth, for instance, of 950 deaths 108 were from *tuberculosis*, and, at Aleppo, 183 out of 1,320. This disease is feared and the natives take complete measures of disinfection, going so far as to destroy the patient's house on his death. In cases seen the course was rapid. Venereal diseases and eye diseases are common, especially the latter; dust and flies abound.

A. G. B.

CHIRAY (M.). **La médecine au Brésil.**—*Presse Méd.* 1923. Apr. 18. Vol. 31. No. 31. pp. 637–645. With 6 text figs.

In Brazil there are medical faculties at six centres, Rio de Janeiro, Sao Paulo, Bahia, Bello Horizonte, Rio Grande do Sul, and Parana; the author visited the two first. Rio de Janeiro is the most important, with 2,000 students, 31 titular professors and 19 assistant professors; only one of the four projected university buildings has been completed, and it is described as " a very happy realization." The magnificent Instituto Oswaldo Cruz, " a palace of gorgeous sumptuosity," one of the great research centres of the world, is Rio's crown and Brazil's glory. The medical faculty of Sao Paulo rivals that of Rio, and in its Institute of Serotherapy and its park of venomous snakes for the production of antivenene Sao Paulo possesses an establishment of world-wide renown. There is an Academy of Medicine and a Medico-Chirurgical Society in both places.

The medical curriculum in Brazil extends to six years. The programme of study conforms pretty much to the best European standards and the students are keen, but the teachers are too few and the hospital accommodation and organization need improvement; the examiners had the reputation of being too indulgent.

A. Alcock.

SEI (Shigemoto). **Ueber die histologischen Veränderungen in den sogenannten klimatischen Bubonen unter besonderer Berücksichtigung der Gitterfasern.** [The Histological Changes in Climatic Bubo, with special reference to the Lattice Fibres.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 3. pp. 81–93. With 2 coloured plates. [16 refs.]

This paper gives a detailed account, with coloured illustrations, of the histological changes observed in the lymphatic glands in climatic bubo; the account does not profess to do more than confirm the statements of other observers. The typical changes seen in the earlier stages are those of a fibrinous inflammation with patches of desquamated endothelial cells and damaged vessels embedded in proliferated epithelioid cells; these patches undergo necrosis and are often thickly studded with fragments of broken-down nuclei. Later, the whole gland substance and its reticulum are invaded by proliferated connective-tissue the fibres of which become thickened and involved in a hyaline collagenous network and then quickly break down. The coloured illustrations show well the endothelial proliferation, the appearance of the necrotic patches, and the hyperplasia and further transformation and breaking down of the connective-tissue and reticulum of the gland.

A. A.

PATRICK (Adam). **Report on Bacteriological Examinations in Cases of Influenza, Malta Command, 1918.**—*Jl. Roy. Army Med. Corps.* 1923. Feb. Vol. 40. No. 2. pp. 133–138.

This study comprised the examination of sputa from 187 patients, and 23 autopsies. Among other organisms diplo-streptococci were found in 94 per cent. of the sputa, *S. aureus* in 27 per cent., and *B. influenza* in only 4 per cent.; in 83 per cent. of the fatal cases *S. aureus* was found. No clue was obtained to the nature of the primary infection. The occurrence of *S. aureus* in a large proportion of fatal cases has not, the author believes, been recorded; he notes that staphylococcus infections of the skin are very common in Malta. He does not think that the infrequency of the influenza bacillus was due to the unsuitability of the media employed.

A. G. B.

LOW (George C.). **Elephantiasis Nostras. Description of a Case, with Autopsy Findings.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 77–81.

The elephantoid swelling in this case began 26 years after the patient had left India (where he had served in the army for eight years) and had returned *permanently* to England. When admitted into the Hospital for Tropical Diseases, six months after the swelling began, the patient's feet, legs, scrotum, penis, and abdominal wall up to one inch of the navel were in a state resembling elephantiasis of filarial origin. While in hospital he had frequent attacks of lymphangitis. As the state of his genitalia was giving him much trouble, the scrotum and a considerable part of the elephantoid tissue of the penis were removed. Ultimately the patient died of intercurrent broncho-pneumonia. At the autopsy the lymphatic obstruction was found to be due to extensive scirrhoid carcinomatous infiltration of the lymphatics and lymphatic glands of the pelvis, which were inextricably matted together as high as the receptaculum chyli. The axillary glands also were infiltrated and enlarged, though not embedded in altered lymphatic vessels. The prostate was similarly enlarged and much hardened, and it probably was the original source of the (metastatic) infiltration of the lymphatics. No calcified filariae or other evidence of filarial infection were observed. Extensive scars of long antecedent excision of buboes were found in both groins, and this may have been a contributory cause of the obstruction that ended in elephantiasis.

A. A.

RAMOS (Oscar). **Tratamento da "elephantiasis nostras" do membro inferior pela operação de Kondoleon.** ["Elephantiasis nostrás" of the Leg treated by Kondoleon's Operation.]—*Arch. Brasileiros de Med.* 1923. Mar. Vol. 13. No. 3. pp. 281–289. With 2 text figs.

A woman, 25 years of age, who had had eight children, presented a condition of "elephantiasis nostras" of the left leg of five years' duration. In November, 1919, extensive removal of redundant tissue was performed, but by March, 1920, the condition was as bad as ever. Kondoleon's operation, but modified by leaving small bridges of muscular aponeurotic sheath, resulted in cure.

H. Harold Scott.

THAVARA (Mom Chow). **A Preliminary Report on an Epidemic occurring among Recruits in a Training Station in Siam.**—*Jl. Trop. Med. & Hyg.* 1923. Mar. 15. Vol. 26. No. 6. pp. 89–92. With 3 charts.

Two epidemics of an exanthematous fever—one in May–June, of 24 cases; the other, in August, of 6 cases—in a strength of 650 officers and men. In the first there were four deaths, three on the third day from sudden heart failure, and one after 12 weeks, from exhaustion; in the second, one case having a purpuric eruption ended fatally on the second day, from sudden heart failure. Many of the recruits, though none of the patients, were infested with head lice.

In every case the disease began with a very sudden rise of temperature, and nearly always with severe pains in head, back, joints, and all the limbs, so that the first few cases were diagnosed as dengue. On admission there was usually a copious rash on the arms and hands and the legs and feet, never on the abdomen, only once on the chest, but usually one or two spots on the forehead. The lungs, liver and spleen appeared normal, the heart was regular but rapid, and the pulse strong and of good tension. The bowels were constipated, though in one or two cases there was at the beginning frequent diarrhoea, and though the tongue was foul the appetite was remarkably good. There was not any albumin in the urine, but difficulty of micturition, sometimes even retention of urine, was an early and persistent symptom.

The temperature, rising suddenly to 102° F. or more at the outset, became normal in mild cases between the 4th and 7th days; but in severe cases continued to rise till the 3rd–5th day (in one case to 106° F.), continued of a remittent type for two to five weeks and remained above normal for six to eight weeks.

The pains in mild cases gradually subsided with the fever; but in severe cases the intense headache was accompanied by insomnia and maniacal excitement and rigidity of the spine (without the appearance of Kernig's sign), and this, after two or three days, gave place to apathy, confusion, amnesia, and some general loss of memory. In the severe cases all the joints became swollen and very painful, the inflammation appearing to be outside the joint.

The initial rash faded on pressure, but in course of time it became dark—eventually almost black—and persistent; in some cases it terminated, about the eighth or ninth day, in desquamation; in other cases it became vesiculous and pustulous.

With the persistence of the disease the dry febrile skin turned persistently moist and the patient became wofully emaciated and feeble.

In the cases of the first epidemic nothing foreign could be found either in the blood or in the contents of the pustules, whether by the microscope or by culture; but three out of four guinea-pigs inoculated with the blood died in the course of the third week afterwards, revealing nothing abnormal post mortem.

In one only of the cases of the second epidemic was anything abnormal discovered. This was a mild case, with a maximum temperature of 104° F. becoming normal on the fourth day and the symptoms disappearing on the seventh day—all but the pains in the joints, which lasted till the tenth day. Blood-cultures from this case revealed a bacillus " having all the appearances of *B. pestis*." No case of plague, however, had been reported in the neighbourhood for many years: and no evidence of plague was found in 63 rats killed in the barracks, though of four rats killed in the neighbouring market the spleen of one contained " a plague-like bacillus."

It is to be remarked as characteristic of the disease that convalescence was prolonged, and that where the inflammation of the joints had been severe the convalescents were unable to walk for many weeks. No complications or sequelae were observed.

A. A.

McCONNELL (R. L.). **A Case of Myositis Purulenta Tropica.**—*Jl. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 26. No. 4. pp. 57–59. With 3 text figs.

A native was admitted to hospital in Uganda as a case of rheumatic fever, complaining of severe pain in all the large joints and back, with temperature 103°. A fluctuating swelling on the chest was opened and 3½ oz. of anchovy-like pus let out. Between this date, June 18, and July 9, abscesses were opened in the thigh (2), over spine of scapula, the neck (2), the buttock, and similar pus evacuated and the original abscess was twice opened up. On August 15 there were signs of an iliac abscess and on the 19th, in anticipation of its being opened, the patient disappeared. He was seen six weeks later when little was left of the swelling, which had quite gone after a month. An evening rise of temperature occurred throughout, and night sweats were frequent. Filarial larvae were sought in the blood by night and day without success. Objects are figured which were found in pus—two (?) nematode larvae 55–60 μ $\times 3 \cdot 5$ and 45 $\mu \times 2 \cdot 3$ and what appeared to be a coiled worm.

A. G. B.

HOWARD (Albert), SIMONSEN (John Lionel) & ANDERSON (L. A. P.). **A Preliminary Note on Lathyrism.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 857–859. [14 refs.]

The authors have been unable to find any trace of alkaloid in the Khesari grain (*Lathyrus sativus*) either in the fresh state or after storage but have discovered a base or mixture of bases giving the ordinary test for alkaloids in the seeds of *Vicia sativa* which occurs in all the cultures raised from bazaar Khesari seed. *Vicia sativa* has been already shown to contain a glucoside base named vicine for which divicine is obtained on hydrolysis. They are now examining divicine hydrochloride pharmacologically.

A. G. B.

MENDELSON (Ralph W.). **A Case of Combined Pellagra and Beriberi.**—*Jl. Trop. Med. & Hyg.* 1923. Jan. 1. Vol. 26. No. 1. pp. 6–7. With 1 text fig.

The salient points of this case are these :—

The patient, aged 27, a native Siamese policeman, had been free from illness hitherto ; there was no history of metallic poisoning. On admission to the clinic he complained of difficulty in walking, tightness and numbness in the legs, sore tongue, diarrhoea and an eruption on the hands, feet and scrotum. The tongue was swollen, red with raw patches, very painful. The backs of the hands looked as if they had been painted with iodine ; there were a few bullae and vesicles. The left knee jerk was barely perceptible, the right absent. The feet (illustrated) showed bullae and vesicles. No oedema. " The gait is typical of that of an acute polyneuritis of the lower extremities. . . . The scrotum is quite typical of acute pellagra." (no further details). The pulse was 100–120. No malaria. Blood Wassermann negative.

The author notes that beriberi is common in Siam and especially in the police force ; the staple diet is white, finely polished rice. This, he believes, is the first case of acute pellagra observed in Siam and the chronic disease is rare. No instance of the association of the two diseases is known to him.

[The patient had taken " a few doses of native medicine " and one wonders whether the diagnosis of chronic arsenical poisoning was considered.]

A. G. B.

BRUSA (Piero). **Contributo allo studio del linfogranuloma maligno.** [Contribution to the Study of Lymphogranuloma malignum].—*Haematologica.* 1923. Jan. Vol. 4. No. 1. pp. 1–22. [22 refs.]

The case of a boy, seven years of age, is recorded, with the signs and symptoms of Hodgkin's disease. The axillary, cervical and subclavicular glands were involved, and probably some of those in the mediastinum also. The spleen was enlarged. The child died three and a half years after the first glandular enlargement appeared. Autopsy was refused, but examination of an excised gland revealed the presence of round or oval bodies of varied size (two to six microns), singly or in groups, a few free but more in large cells like endothelial cells. They stained well by Giemsa, better still by Pacinotti's method. Some appeared to be homogeneous, others possessed a chromatin mass, like a nucleus. In some there were two such masses and where this was the case one was larger than the other. The author states that they strongly resemble the " Histoplasma capsulatum " described by DARLING [believed to be a Cryptococcus] and he is of opinion that they are of protozoal nature. All attempts at cultivation proved negative.

H. Harold Scott.

SEN (Satya Charan). **A Case of Broncho-Moniliasis.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. pp. 164–165. [3 refs.]

A Hindu of 58 suffered from fever with enlargement of liver and spleen, and finally broncho-pneumonia. The sputa were milk-white, of the consistency of glycerine. Thrush-like patches were numerous in the mouth. No T.B. in the sputa but oval yeast bodies and mycelial threads. *B. coli* was grown from the urine and both *B. coli* and the fungus from the sputum. The cultural and biological characters of the fungus are given ; it resembled *Monilia tropicalis* but was harmless to guinea-pigs. No autopsy.

A. G. B.

De Finis (Giuseppina). **L'immunoterapia del tifo, dei paratifi e della febbre mediterranea con i vaccini lisizzati Di Cristina e Caronia.** [The Treatment of Typhoid, Paratyphoid, and Undulant Fevers with Lysed Vaccines of Di Cristina and Caronia.]—*Pediatria.* 1923. Jan. 1. Vol. 31. No. 1. pp. 11–23. [9 refs.]

Brief records in tabular form are given of 90 cases of typhoid fever, their ages varying between 17 months and 25 years, treated by vaccines. The initial dose was 1 cc. intramuscularly or 0·5 cc. intravenously ; thereafter, on alternate days, was given a dose of twice the volume. The diagnoses were made by agglutination or by blood culture —the latter in 26 instances.

Temperature fell by crisis or rapid lysis, in some after the first injection, in the majority after the third or fourth, with marked improvement both in the general state and in individual symptoms. There were no fatalities, though some of the patients were in a serious condition, drowsy and delirious, when treatment was started.

Thirty-five cases of paratyphoid infection are recorded, 10 of Paratyphosus A, 24 of Paratyphosus B, and 1 of both. One died ; he was very ill and emaciated and, in fact, died on the first day.

Of undulant fever there were 55 cases, the organism being isolated from the blood in seven. The acute cases were found to yield usually after three injections, the more chronic required eight to ten. There was never a very marked reaction, and the results seemed to be the same whether the intramuscular or the intravenous route was chosen.

H. Harold Scott.

M'Kendrick (A. G.). **House Infection in Cholera and Cancer.**—*Edinburgh Med. Jl.* 1923. Mar. N.S. Vol. 30. No. 3. (Trans. Med. Chirurg Soc. Edin.) pp. 53–61.

The title of this remarkable paper is misleading ; some instances of house-incidence in cholera-epidemics and in cancer-cases are used to illustrate an argument of very much wider compass. After some criticism of the common notion that the problems of medicine are not the subject-matter of exact science, and after some demonstration that the apparent difference between the science of medicine and the "exact sciences" depends chiefly upon the many accidents of observation in the former, the author goes on to show by specific illustrations how the exactest methods (of mathematics) may be used by the medical observer to give exact and verifiable interpretation to his collected facts. We shall best do justice to the author's argument by reproducing one of his illustrations.

"An epidemic of cholera occurred in an Indian city The total number of cases was 139, and these occurred amongst a population of tens of thousands. The infection was consequently minimal. The city received its water supply from a watershed, some fifty miles distant. The streams collected into a large lake. Contamination in transit was unlikely, the probable sources of water contamination were in the watershed area. It was calculated that the water took over eight days to pass from this area to the city. Now, in test-tube experiments, the vibrio dies out in two or three days, so it was argued that what was true in the case of the small bulk of water in the test-tube must be true for the large bulk of water in the lake and streams, and hence the epidemic could not be water-borne. I have already dealt with this fallacy.

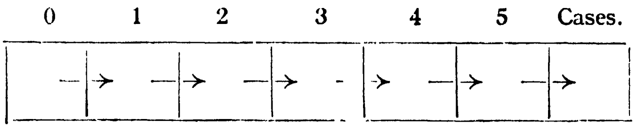
"The problem may be attacked as follows. Let us consider house infection, and tabulate the house distribution of an epidemic at various intervals thus :—

"Houses with :—	0 Case.	1 Case.	2 Cases.	3 Cases.
At first	1,000	—	—	—
Later	990	9	1	—
Still later ..	980	17	2	1

"The houses were at first free, then some picked up their first case. At a still later period some of these passed on to two or three cases, whilst others received their first case—and so on.

"This may be generalised in a diagram.

"Houses with :—



"Any particular house passes from one compartment to the next, and follows the path shown by the arrows, each arrow depicts the chance that a house may receive an infection and pass into the succeeding compartment.

"Now, if a disease be distributed in a random manner, for example by water, these chances or arrows will all be of the same magnitude ; but if the disease is spread by infection, then the arrows will tend to increase (for the chance of a fresh case occurring will tend to increase) with the number of cases which have already occurred in that house.

"The problem is, then, to detect from observations whether the arrows do or do not increase with the number of cases.

"Now those of you who are interested in chemistry will at once recognise that this is a problem of mass action, that is to say, a problem of probabilities. It is like a consecutive unimolecular chemical reaction where the stages are :—

$$A \to B \to C \to D \to .$$

"The solution presents no difficulties. If we denote the value of an arrow as being approximately $b(1+ax)$, then all that is required is to find the value of a from the statistics. If it is positive, then the arrows will increase with x, the number of cases in the house. If it is zero, then the arrows will be constant, and the distribution is a random one. If negative, the arrows will decrease, and give evidence of some deterrent factor.

"From the solution of the set of equations to which the diagram gives rise, we can also evaluate the total number of individuals (in this case of houses) which participated in the phenomenon. This is very important, because this total is often not exactly known, for example, in the case of water-borne infections, an area may have a number of water supplies only one of which may be contaminated.

"In the case under consideration it was found that the arrows did not increase ; and that, consequently, the distribution was a random one. The most probable random cause was the water supply. Chlorination was introduced, with the result that there followed a reduction in the mortality from intestinal diseases of a little over 70 per cent., as deduced from statistics contrasting the preceding period of five years with the five years during which chlorination was employed.

"The figures were :—

		Observed.	Calculated.
Houses with 1 case	..	129	128
Houses with 2 cases	..	9	10
Houses with 3 cases	..	1	1

"The results of this experiment are not beyond criticism, but they afford an indication of the power of the method."

A. A.

DELAMARE (G.) & ALALOU. **Pseudosymbiose vibrio-spirochétique (Vibriothrix).**—*Bull. sanitaire de Constantinople.* 1923. Apr. Nos. 11 & 12. pp. 105–108. With 1 plate. [5 refs.]

In the summer of 1922, when cholera and dysentery were rife in southern Russia, the authors observed in smears of peptone cultures of faeces of some Russian refugees some organisms resembling vibrios and some others resembling spirochaetes. These, after due study, they determined to be different forms of one organism—CASTELLANI's *Vibriothrix ceylanica.* The vibrionic (and bacillary) elements predominate in liquid media, the spirillar (and filamentous) elements in the scum. The organism is worth attention on account of its misleading nature. It can be distinquished from the cholera vibrio by the amber or rosy colour of its culture on potato, by the lack of gelatolytic and saccharolytic properties, by the production of indol, and, of course, by its non-agglutination with anticholera serums; and from true spirochaetes by the larger size, readier staining, and facility of aerobic culture on ordinary media.

A. A

TRICOIRE (R.). **Etude de l'association de l'amibiase et du paludisme.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 304–308. [6 refs.]

In the region where the author practises, Taza, in Eastern Morocco, amoebic dysentery is common, bacillary very rare, and half the dysentery patients have also malaria. The result is a variety of clinical pictures, sometimes one disease, sometimes the other being in the foreground, and sometimes there are few symptoms but cachexia. Such cases as these form good soil for tuberculosis, to which 6 out of 45 succumbed. The author suggests that there are special reasons for malaria and amoebiasis reacting on one another. At the onset of malaria the liver functions excessively, causing a large flow of bile especially about the 18th hour and the two succeeding days. This is the occasion of the amoebiasis relapse, as a result of a natural "biliary test" such as has been described by LE NOIR and DE FOSSEY [this *Bulletin*, Vol. 19, p. 688]. When amoebiasis arouses malaria it acts like cold, fatigue and the like, or there may be a more intimate link.

When malaria is resistant to quinine, and in well-treated cases the temperature remains irregular, when amoebiasis relapses without obvious cause, when amoebic hepatitis resists emetine, if apart from febrile periods the liver remains painful, suspect the presence of both infections.

In treatment the author gives adrenalin, as well as quinine and emetine either by the mouth or, in bad cases, by injection. Strychinine and cacodylate of soda are useful. The combination of neosalvarsan with emetine has yielded no better results.

A. G. B.

LABERNADIE (V. G. F.) & PEYRE (E. L.). **Importance de l'examen du sang pour le diagnostic du saturnisme.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 348–352.

A ship left France on October 31, called at two ports in the French Antilles and on December 14 reached Cayenne. Illness on board was possibly smallpox, so that here a careful examination was necessary. About 12 men were sick, the symptoms being vomiting, violent joint pains and myalgia, prostration, constipation alternating with diarrhoea, violent colic, loss of appetite, thirst; the asthenia was profound. These symptoms had been present most of the voyage and eight men had been put off at the harbours touched. There was nothing pointing to variola. Nine sailors were admitted to hospital, and as a routine measure the blood and stools were examined. In all there were noted red cells with basophilic granulations, which pointed at once to the diagnosis. Burton's lead line was present in five. The proportion of basophile cells increased with the intensity of Burton's line: in cases in which it was 60 per cent. the line was very clear, and where it was 12·5 per cent. or below the line was faint or absent. There were no eosinophiles. Examination of the lining of the ship's saucepans showed the presence of more than 20 per cent. of lead. The authors draw attention to the semblance of these attacks to an epidemic disease. [They do not, however, make clear the source of the lead.]

A. G. B.

TAYLOR (J. A.). **Anthrax in Ankole, Uganda.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 51–54.

Anthrax in man in Uganda, of which a case was reported by PEACOCK and DUKE (this *Bulletin*, Vol. 20, p. 42) and an earlier case by SPEARMAN (*op. cit.* Vol. 10, p. 236), seems to be not altogether uncommon. In November, 1918, seven cases, and in January, 1919, two more cases, were brought to the author's notice in the Ankole district. The first seven cases—in six of which bacilli were found—were traced to a kraal where a cow dead of the disease and full of bacilli was discovered cut up for market: it was discovered also that a cow had died in this kraal about three weeks before, and that six of the patients had eaten, and one had carried, the meat of that animal. Consequent observation of neighbouring kraals disclosed, in the course of a few days, the death of two cows in other herds; smears taken from different parts of one of these all contained anthrax bacilli. As regards the two cases in January, a history was obtained in one of them of the patient having been scratched by a thorn in a kraal that had been vacated some months before in consequence of the death of some of the cattle there.

Inquiries made by the author at that time brought to light the facts that the disease was well known among the cattle-owning Bahima by the name *kirasi* when a malignant pustule is to be seen, and *obuzimba* when an animal dies suddenly in a herd where a *kirasi* has recently occurred. They have no name for the generalized infection in man, but when a human being suffering from a *kirasi* dies, he is said to have died "of eating obuzimba meat." The Bahima, however, do not eat the meat of an animal deal of *obuzimba;* they bury the carcass deep and cover the sepulchre with thorns, to keep hyaenas from getting at it and spreading the infection.

A. A.

GREGG (A. L.). **Two Abnormal Cases of Pigmentation of the Colon.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 72–76. [4 refs.]

In the course of more than 300 hospital examinations of the bowel by sigmoidoscope the author has only twice observed pigmentation of the colon. This condition has, indeed, been described in post-mortem observations, and has been ascribed to absorption or deposition of lead, mercury, and bismuth. In both of the cases observed by the author the patients had at some time been treated with bismuth, but many of the other 300 patients had taken bismuth freely, so that if this pigmentation can be caused by bismuth there must also be some other concomitant causal factor. The pigmentation is described as a fine black mottling.

A. A.

LEVADITI (C.) & NICOLAU (S.). **Mode d'action du bismuth dans les trypanosomiases et les spirilloses.**—*C. R. Acad. Sci.* Paris. 1923. Apr. 23. Vol. 176. No. 17. pp. 1189–1192. [5 refs.]

Levaditi and YAMANOUCHI in 1908 showed that atoxyl, which is inactive in vitro, becomes strongly trypanocidal when brought in contact with a fresh extract of liver at 37° ; an observation which suggests that atoxyl and similar remedies undergo changes in the organism before becoming parasiticidal. The authors made similar experiments with bismuth, mixing a solution of tartrobismuthate of sodium and potassium with an extract of rabbit's liver, and after an interval adding Nagana trypanosomes or *Spirochaeta gallinarum.* The parasites were first immobilized, then killed in the liver mixture, whereas in control mixtures they were unaffected. Kidney, lung, mesenteric glands, suprarenals, ovary, brain and muscle had the same action in varying degree as liver ; blood, serum, eggs and yeasts were inactive. The liver of fowl, guinea-pig, rat, horse, sheep or calf may be substituted for that of rabbit. They call the compound formed *bismoxyl.* Other bismuth salts can be used and even metallic bismuth undergoes some transformation. The quantity of bismoxyl formed depends on the quantity of liver extract. The protein substance of the extract is chiefly responsible; the parasiticidal property is found in the albuminoid precipitate which forms on standing. Collected and washed it keeps this property for 17 days. If the mixture is dialysed the property is found in the dialysate when every trace of bismuth has disappeared from it. It is concluded that a toxalbumin is formed which when absorbed by the parasites kills them. Reference is made to similar experiments with atoxyl and with tartar emetic.

A. G. B.

PERALTA (Daniel), M'ACORMICK (David D.), CARVAJAL (Martin), PRADILLA GONZALEZ (Francisco), GOMEZ (Andres), VALDIVIESO (Julio), SERPA (Roberto) & ARDILA GOMEZ (Luis). **La epidemia actual de Bucaramanga [Colombia].**—*Repert. de Med. y Cirug.* 1923. May. Vol. 14. No. 8. (No. 164.) pp. 301–331.

The authors describe in detail cases of a disease which in almost every particular corresponds with yellow fever, both clinically and in the post-mortem findings. The diagnosis is discussed fully, especially as between yellow fever and epidemic jaundice, and it is concluded that the disease is probably the former; 80 per cent. of cases, however, are mild and the case mortality is only 15 per cent. The Department of Health strenuously denies the possibility of there being a focus of yellow fever at Bucaramanga; hence this paper to bring the question into prominence.

H. Harold Scott.

PERRY (H. M. J.). **A Staple Haemolytic Serum for Use in the Wassermann Reaction in Tropical Climates.**—*Jl. Roy. Army Med. Corps* 1923. June. Vol. 40. No. 6. p. 456.

This communication by Lt.-Col. Perry, O.B.E., states that the dried (soloid) haemolytic serum made by the Wellcome Laboratories had been found to withstand prolonged high temperature with little decrease in value. It had not been possible, however, to maintain a supply of uniform quality. Dr. O'BRIEN, Director, Wellcome Physiological Laboratories, has now produced a glycerinated serum which under experimental conditions has remained unchanged for periods of three months at 37° C.

Dr. O'BRIEN has supplied the following data:—

Experiment 1.	Original serum titre 2,400. After incubation at 37° C. for 3 months. Titre of glycerinated serum 2,400. Titre of ordinary serum 200.
Experiment 2.	Original serum titre 3,000. Titre of glycerinated serum 2,300. Titre of ordinary serum 375
Experiment 3.	Original serum titre 3,700. Titre of glycerinated serum 3,500. Titre of ordinary serum 1,000.

Samples of glycerinated haemolytic serum have been tested at R.A.M.C. College and found to be satisfactory. It is suggested that when haemolytic serum for laboratories abroad is ordered the glycerinated product be requested.

H. M. Hanschell.

i. LANCET. 1923. Aug. 4th. pp. 235–236. [Leader.]—**Precipitation Tests for Syphilis.**

ii. JOFFICK (S. D.). **Practical Suggestions for performing the Sachs-Georgi Test for Syphilis.**—*China Med. Jl.* 1923. May. Vol. 37. No. 5. pp. 372–381. [22 refs.]

iii. COCHRAN (Samuel). **A Simplified Precipitation Test for Diagnosis of Syphilis.**—*Ibid.* pp. 382–387. [2 refs.]

i. The Lancet in a leading article reviews briefly the principles of the precipitation tests for syphilis first introduced by SACHS and GEORGI.

In the endeavour to elucidate the mechanism of the Wassermann test it became apparent that under many conditions syphilitic sera would give precipitates more readily than would normal sera. The Wassermann test, one of the most trustworthy of all clinical pathological diagnostic measures, consists of two parts. In the first, syphilitic serum and antigen are brought together in the presence of complement; and in the second, the existence, or disappearance, of this complement is sought for by adding red blood corpuscles and the appropriate haemolytic serum. *The essential of the test* is the production of a precipitate between the syphilitic serum and the antigen, which is a colloidal suspension of lipoid particles.

In the presence of syphilitic serum the physical state of this colloid differs in only partially known fashion from its state in the presence of normal serum, and in the former case it is particularly favourable to the adsorption and inactivation of complement, which thus disappears from the mixture so far as its subsequent demonstration is concerned. If we could detect this alteration in the antigen visually, we could dispense with complement, haemolysin and blood cells, not only simplifying the test but probably making it more accurate. Is the visual method as delicate a one for detecting the formation of a precipitate between serum and antigen as is the fixation of complement? On the answer to this depends the form of serum test for syphilis to be adopted in the immediate future. It is already abundantly proven that a strongly positive Wassermann reaction corresponds to a strongly positive precipitation test; but in both cases shading off from the positive into the negative is not an abrupt process. Research should be directed towards the weakly positive; the evolving and declining cases. *Comparison of the two tests with the clinical condition*, which must always be closely watched, will yield information of the most value as to their relative merit.

ii. Dr. Joffick begins, significantly, the account of his very careful, interesting and well documented work, with the admonition to bear in mind that the Sachs-Georgi test is not so simple as it at first appears. The slightest mistake in technique may give rise to false results. His paper gives in clear detail and at length, the special titrations and experiments and the final technique developed therefrom by which more constant results with Sachs-Georgi may be obtained. The detail of preparation and standardization of reagents and the method of their use, are in each instance all-important, and unfortunately his account of these procedures cannot usefully be summarized. After testing several thousand sera by his technique Dr. Joffick emphasizes the fact that the Sachs-Georgi test even though giving very specific results in the hands of experienced workers, cannot yet replace the Wassermann test. It is an excellent test with which to check the Wassermann results and in some cases will give a specific strongly-positive reaction where the Wassermann has given a weakly positive, a doubtful, or even a negative result. There are, however, also cases where the Sachs-Georgi fails to give a positive reaction with a syphilitic serum. He closes the paper by quoting CRAIG—" The interpretation of the results of the Wassermann test must rest very largely with the clinician, for the clinical picture present is often more decisive than is the result of the test, and it is the clinician's place to reconcile the result of the test with the clinical picture, rather than the serologist's." Dr. Joffick agrees with this opinion and applies it equally to the Sachs-Georgi test.

iii. Dr. Samuel Cochran differs from Dr. JOFFICK to the extent in being rather seized by the simplicity of the Sachs-Georgi flocculation test. Nevertheless he states that up to the present none of the many modifications of the Sachs-Georgi test is so reliable as to replace the Wassermann in places where the latter can be performed. [The reviewer cannot refrain from asking: Does any set of circumstances or any place justify the use of an unreliable test for purposes of clinical aid—apart from investigation as to the limits of its reliability as compared with other methods?].

Dr. Cochran's simple technique is as follows :—

Antigen, alcoholic beef heart extract made in the manner customary for Wassermann tests ; incubated at 37° C. for one or two weeks, being shaken once or twice daily ; at end of this time filtered, and kept in amber coloured bottles at room temperature in a dark place. This and 0·85 per cent saline solution are the only reagents used.

Blood Serum for testing is inactivated at 57° C. for 30 mins. It should be clear, free of red blood cells and not tinged with haemoglobin.

Preparation of antigen suspension. 0·5 mil of antigen in a 1-mil pipette is passed to the bottom of a large test tube containing five mils of saline solution. The antigen is expelled by quick expiration ; the object being to make a sudden and complete mixing of the antigen in the suspension fluid ; there should result a clear slightly-whitish opalescent fluid.

Test: take 2–10 mil. of inactivated serum in a capillary pipette and introduce it to the bottom of a 6×75 mm. test tube ; overlay it with an equal volume of antigen suspension, so as to secure a sharp line of demarcation ; put aside for 10 mins, where it will not be jarred, and examine.

A white ring appearing at junction of fluids signifies a positive result, and no further observation is necessary. If after 3 hours at room temperature no ring has appeared the result is negative.

Notation—plus = distinct ring ; plus-minus = fine ring ; minus = no ring at all.

Precautions. (1) Serum must be clear and not contaminated.
(2) Light must be suitable.
(3) A sharp line of contact between the fluids must be secured.

As a routine each test was done in duplicate using two different antigens as controls for each other. Usually the two tubes gave similar testimony but *not infrequently* dissimilar—causing doubt as to the verdict. Controls necessary are known positive and negative sera.

This test was performed on over 2,000 sera : and after analysing results Dr. Cochran concludes that :—

(1) The precipitation test is in the main in close accord with the Wassermann.

(2) It is a valuable adjunct to the Wassermann as a routine procedure. It sometimes calls attention to syphilitic sera that the Wassermann misses.

(3) It is simple and quickly performed.

(4) However, though agreeing with the Wassermann in 93 per cent. of tests, where disagreement occurred *the Wassermann was in closer accord with the clinical diagnosis.*

We may point out, now, that all leads to the patient and the clinician as the ultimate sanctions of the trustworthiness of the test. Clinical observation and knowledge is still indispensable for the serologist.

H. M. Hanschell.

i. BARRETT (James W.). **The White Man in the Tropics.** [Correspondence.]—*Brit. Med. Jl.* 1923. Feb. 10. p. 260.
ii. ——. **White Australia Policy.**—*United Empire.* 1922. Nov. Vol. 13. (New Series). No. 11. pp. 679–683.

i. After pointing out that Tropical Australia is divisible into four portions, viz. the East Coast of Queensland, the interior plateau of Queensland, the Northern Territory, and the Northern portion of Western Australia, each with characteristics of its own, the author points out that practically the whole of Australia enjoys a mean temperature of less than 70° wet bulb. According to the Commonwealth Statistician the population of Tropical Queensland increased by 15·28 per cent. in the decennium 1911–21 as against 9·1 and 19·1 per cent. for rural and urban areas in the Commonwealth as a whole ; and for the years 1918–20 the general mortality and infantile mortality rates for Queensland were 11 and 64, both extraordinarily low. The physique of the Queensland men compares favourably with that of other parts of Australia. The poor health of the women is in part at least attributable to the defective housing and sanitation, but in spite of this a vigorous white race is being developed. It is also to be noted that tropical diseases are few. As to the Northern Territory and its comparative emptiness—the population is under 4,000—the Chinese do not remain there owing presumably to the poverty of the country and the 5–7 months drought. Its settlement is therefore an economic rather than a climatic problem. This part of Australia will not fill till the southern parts are crowded.

ii. After drawing attention to the facts cited above, the author asks for valid reasons for the belief that coloured people suffer less than white people from heat. He thinks that the chief difference between the races is that the coloured man adapts himself to the climate by discarding his clothing.

A. G. B.

CHEYNE (W. H. W.). **White Settlement in Tropical Australia.**—*Jl. Trop. Med. & Hyg.* 1923. Mar. 1. Vol. 26. No. 5. pp. 71–81. With 8 figs. [19 refs.]

To those interested in the " Tropical Australia " question this paper is well worth perusal though it does not add anything essential to what has already been published [see this *Bulletin*, Vol. 17, p. 223 ; Vol. 19, p. 525]. The author points out that Tropical Australia has two climates; the coastal, damp and truly tropical and the hinterland, better called subtropical. The hinterland, about 1,000 feet in altitude rises into three plateaux of over 2,000 feet of an average area of 12,000 square miles, one of which, near Cairns, is now being settled and is quite healthy. The conditions of rainfall and temperature, dry and wet bulb, in these several regions are discussed with illuminating diagrams. Rainfall varies between 165 inches at the edge of the Atherton plateau and less than 10 inches in the interior. On the question of settlement it is pointed out that there is no large native population—the total number of aborigines in the whole of Australia does not exceed 100,000—and sun-stroke is almost unknown. In the hinterland tropical diseases are negligible ; in the coastal area malaria, hookworm, filariasis, dengue, occur : *Stegomyia fasciata* is very common ; trachoma and barcoo rot (a form of veldt sore) are found. None of these diseases is serious in Australia.

The author reaches the conclusion that there appear to be no scientific reasons why white people should not successfully inhabit the north, but three or four generations of whites born, bred and intermarried in the tropics must pass before the matter can be decided. It is doubtful whether the northern lands are fitted for close white settlement owing to the prolonged droughts but irrigation may solve this difficulty.

A. G. B.

i. RODENWALDT (Ernst). **Die Mestizen von Kisser und die Frage der Akklimatisation der europäischen Rassen an das tropische Klima.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. July. Vol. 27. No. 6. pp. 202–205.

——. **The "Mestizos of Kisser" and the Problem of Acclimatization of the European Races in the Tropics.**—*Med. Jl. Australia.* 1923. July 7. 10th Year. Vol. 2. No. 1. pp. 6–8.

ii. ELKINGTON (J. S. C.). **The Mestizos of Kisar.**—[Correspondence.]—*Med. Jl. Australia.* 1923. July 21. 10th Year Vol. 2. No. 3. p. 81.

i. The author, who writes from Java, wishes to controvert the statement that the Mestizos of Kisser are a white race acclimatized to the tropics, and to criticize a paper by ELKINGTON [who is in the German version miscalled EDINGTON], (see this *Bulletin,* Vol. 20, p. 14). ELKINGTON has erred in implying that any of the Joostencz family were pure-bred—they were all hybrids with the exception of the Dutch father who came to Banda in the first half of the 18th century, and all married hybrids or natives; and in stating that the colony is subject to malaria, for it is malaria-free; and he is ten years out in a date.* [ELKINGTON, however, allows the mixture of blood, so that the issue between the two authors is its degree. Rodenwaldt describes the Kisserese as having more coloured blood than European.]

ii. Elkington writes that he obtained his information from the Dutch Resident at Koepang, and it gave the detailed genealogical trees of the several families. RODENWALDT's statement that malaria is absent from Kisser is " flatly and totally incorrect ".

A. G. B.

MACKINNON (Murdoch). **Education in its Relation to the Physical and Mental Development of European Children of School Age in Kenya.**—*Jl. Trop. Med. & Hyg.* 1923. May 1. Vol. 26. No. 9. pp. 136–140. With 2 charts in text.

From the study of upwards of 500 children born and reared in the highlands of Kenya (5,000–6,000 feet) the author concludes that the general physique is much above that of children at home. He gives two curves of height and weight respectively showing the average annual increase between 6 and 17 years for boys and girls in Kenya and England. Kenya children according to this comparison are taller than English children till 15, when the English boy passes the Kenya girl but the Kenya boy keeps ahead all the time. Similarly the Kenya children are heavier than the home children at every age except at 12 and 13 when the Kenya boy falls back. The author would attribute this difference in stature and weight partly to the stimulating effect of warmth and light but also to the very liberal and varied diet of the Nairobi school where special attention is paid to vitamins. He gives the daily ration with the caloric value of its items, a total of over 3,400 calories, " equal to what is considered necessary for a hard working man in a cold or temperate climate ".

---

* The author writes:—"The original article was not at my disposal. I relate to the detailed reference in the *Tropical Diseases Bulletin,* January, 1923, page 14. The numerous mistakes in the dates may be put down to the reference."

This is not the case. The dates in the *Bulletin* correspond exactly with those in ELKINGTON'S paper.—ED.

Children born in Kenya or reaching it at an early age develop a degree of mental alertness far superior to that of children of a similar age in a temperate climate, but after the age of 10 a gradual process of mental exhaustion and deterioration sets in, coinciding with rapid increase in height and weight. Dividing the mental faculties into the power of reception, retention and application he finds that at Nairobi the first is remarkably good, the second fails—one of the most striking effects of tropical climates on the nervous system is to impair memory—and the application fails with the retention ; the child cannot apply his knowledge on demand. Children who have left school before twelve and gone to Europe have done well but those who remain fail to qualify for such examinations as the London Matriculation and the Cambridge Junior. He thinks that climate is the main cause of the mental deterioration and that altitude is beneficial rather than injurious, but part of the climate seems to be man-made for " the temperature in the class rooms " in a wood and iron building " is so high that it is quite impossible to expect children to concentrate their attention ". His advice to the Kenya government, therefore, is not to build secondary schools but to encourage by such methods as scholarships the sending of children home after ten to complete their studies in England.

[The author does not give the source of his data for English children so that one is left in doubt whether their diet was equally liberal both in quantity and quality.]

A. G. B.

FÜLLEBORN (F.). **Prof. Arthur Looss.** [Obituary.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 7. pp. 225–228. With 1 plate. [2 refs.]

On the 4th May, after long and grievous suffering of mind and body, the distinguished parasitologist Looss died at Giessen. We learn from this brief record of the principal events of his life that he was born at Chemnitz, in Saxony, in 1861, that, as a young man, he studied for four years under the eminent LEUCKART, in Leipzig, and that at the age of 30 he married. In 1896 he was appointed Professor of Biology and Parasitology in the British School of Medicine at Cairo, where he is said to have worked under " primitive " laboratory conditions and without skilled assistance [as was the lot of all biologists in the East in those days]. There, indefatigable, he remained 18 years, and there he made his ever memorable discovery of the usual mode by which the hookworm reaches its host's intestine through the host's integument. In the fateful year 1914 Looss had to leave all and follow an unkind fate [for which ultimate responsibility cannot be laid upon England]. He had to go back, unhonoured, to his native land, where, for want of any better means of subsistence, he eventually had to become an assistant in the Zoological Institute, at Giessen, and there he died in poverty and affliction.

The chronicler of this sad instance of the mutability of human affairs does not overstate the case when he claims that Looss, in the course of his investigation of the life history of the hookworm, made one of those pregnant discoveries that are no less prolific in the world of ideas than stimulative in the field of practice.

A. A.

LESSA (Gustavo). **O valor da desinfecção terminal. (Esboco do estado actual da questão.)**—*Boletim Sanitario.* Rio de Janeiro. 1923. No. 2. 25 pp.

It would appear that public and even professional prejudice in some parts of South America puts implicit faith—as indeed it still does among the half-educated in many parts of Western Europe—in chemical disinfection as *the* infallible method of protection against the spread of disease from infected premises. The purpose of this paper is to set forth the approved experience of sanitary authorities in the most enlightened parts of the world ; this experience being that the generality of specifically pathogenic micro-organisms are carried about in or on specific living " carriers," apart from which they cannot live long and pullulate ; and consequently that, so far as premises that have harboured infectious cases are concerned, the best, as well as the cheapest and most educative, disinfectants are continuous fresh air, sunlight, and the freest personal and domestic use of soap-and-water and the scrubbing-brush.

A. A.

RODENWALDT (Ernst). **De biologische toestand van de bevolking van het eiland Soemba.** [The Biological Condition of the Population of the Island of Soemba. D.E.I.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 448–464. [1 ref.]

From official figures Rodenwaldt calculates that in several districts of Soemba there exists a considerable surplus of men, whilst the number of children in comparison to the adults is abnormally low. The condition is very marked in the eastern parts of the island, not so pronounced in West Soemba. In looking for causes of this menacing and uncommon phenomenon in an uncivilized population the author attaches much importance to bad sexual habits and fear of the tortures women have to undergo during pregnancy and after childbirth in connection with the " adat " (*i.e.* the unwritten law of the natives of the E. I. archipelago, often founded on religious belief). When interrogated the women would not admit such fear, but the author thinks that it is a strong incentive to criminal abortion. On the other hand yaws may have an inhibiting influence on the birth-rate. Venereal diseases are not widely spread.

W. J. Bais.

KOUWENAAR (W.). **Over voorkomen en beteekenis van occult bloed in de faeces bij tropenbewoners.** [The Occurrence and Significance of Occult Blood in the Faeces of Inhabitants of the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 419–441. With 1 text fig. [16 refs.]

The author tried different tests for hidden blood in the faeces and found the catalytic reactions useless, on account of the frequent occurrence of non-specific reactions, and of the numerous cases in which only iron-free, non-catalytic derivatives of the blood (porphyrines) were found in the stools. The spectroscopic examination, the technique of which is described in detail, is the only trustworthy test in this respect.

The most remarkable result of the author's experiments is that hookworms cause a constant and considerable loss of blood by the intestinal way, which stops after the worms have been expelled. He is of the opinion that hookworm anaemia may be caused by this loss of blood only, without influence of the hypothetic toxin of the worm.

W. J. Bais.

De Langen (C. D.) & Djamil (Mohd.). **Idiopathische hypereosinophilie.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 406–418.

In a native (Malay) patient suffering from asthmatic attacks, the number of leucocytes varied from 12,000–26,000, whilst the percentage of eosinophiles was 75–85. There was none of the well-known causes of hypereosinophilia to be found, apart from the fact that these causes do not produce such high percentages of these cells. Artificial fever (injections of milk and turpentine) caused a temporary drop of the eosinophile percentage.

W. J. Bais.

Bengston (Ida A.). **A Toxin-producing Anaërobe isolated principally from Fly Larvae. Its Relation to the Organisms hitherto known to be Causative Factors in the Production of Botulism.**—*Public Health Rep.* 1923. Feb. 23. Vol. 38. No. 8. pp. 340–344. [6 refs.]

A comparative study of a toxic anaerobe, originating from maggots, that produced in laboratory animals the same effects as types A and B of *Bacillus botulinus*. The material studied consisted of cultures of single cell isolations from larvae of *Lucilia caesar, Lucilia sericata* (*apud* Aldrich), *Lucilia sericata* (*apud* U.S. Museum), and three unnamed species—all the strains of larvae having some original connexion with " limber neck " chickens, except one strain from a horse that died with symptoms of botulism; this fly-material was compared with American strains of type A *botulinus* and type B *botulinus* and with two strains of *botulinus* derived originally from Berlin. The most conspicuous cultural difference observed was that the organism from fly larvae (like one of the strains of Berlin origin) was not—or only feebly—proteolytic. Then the toxin of the fly-larva organism was not neutralized by type A or type B *botulinus* toxin, and conversely the antitoxin of the fly-larva organism did not protect from one M.L.D. of type A or type B *botulinus* toxin. The organism from fly larvae that produces the effects of *B. botulinus* on laboratory animals must therefore be styled type C.

A. A.

Corlette (C. E.). **On Some Relations of Climate, Weather and Fat Covering to Metabolism.** *Med. Jl. Australia.* 1923. Feb. 17. 10th Year. Vol. 1. No. 7. pp. 172–182. With 1 graph. [14 refs.]

The author complains that medical men of every degree have taken but little interest in " the study of metabolism on its dynamical side." If this paper is meant to stimulate the profession it is to be feared that it will fail of its intention. The reviewer has toiled at it for several hours, but is unable to find any particular connexion between its title and its contents, any coherence in its argument, or any attempt to demonstrate any conclusions or define any objective.

A. A.

GOBERT (E.). **Le Kohl.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Vol. 3. No. 1. pp. 90-93. With 1 fig in text. [2 refs.]

The antimonial cosmetic used by Orientals to impart a voluptuous languor to the eyes is known as *Kohl* in North Africa, where, in places mentioned by the author, it is made by mixing finely powdered antimony ore with powdered pearl or coral and pulverized incinerated bat, the living bat having been plunged in hot oil and fried to a cinder.

The chief impurities in the antimony ore are lead, iron pyrites, and silica, and it is thought that the sharp grains of silica may damage the palpebral conjunctiva and predispose to infection, particularly trachoma.

A. A.

HUNT (D.) & HUMPHREYS (L.). **Samoan Tattooing.**—*U.S. Nav. Med. Bull.* 1923. Mar. Vol. 18. No. 3. pp. 346-348. With 5 illustrations.

Samoan tattooing instruments are made of bone and have an edge like a fine-tooth comb; the usual pigment is burnt candle-nut. The area tattooed extends from the loins to the knees, and the operation may take any time from three or four days to two or three weeks according to the fortitude of the patient. Inflammation and fever follow the operation. Sometimes the skin sloughs, and scars and even deformities may then be the result, and occasionally the consequences are fatal. The operator is a professional, held in high esteem; an operator sometimes gets keratitis from pigment spirting into his eyes and as a consequence he may even become blind.

A. A.

MENDELSON (Ralph W.). **Natural Immunity to Infection and Resistance to Disease, as exhibited by the Oriental, with Special Reference to Siamese.**—*Philippine Jl. Sci.* 1923. Feb. Vol. 22. No. 2. pp. 115-125. With 2 charts in text.

Five years experience of Siam, if it has vividly revealed to the author the vast gulf that lies between the hygienic precept of the West and the settled insanitary unconcern of the East, has also led him to the solacing conclusion that Orientals, particularly the natives of Siam, possess a compensating endowment of natural immunity against microbial infection and of insusceptibility to its consequences.

Instances of indifference to traumatic shock are familiar to all who have practised in the East, but can hardly be surpassed by the one described by the author—of a young woman who, after being hacked about the abdomen until the viscera were prolapsed and wounded, and then being wrapped in a sheet and stuffed in a jar and so consigned to the canal, made an uneventful recovery after she had been rescued and brought to hospital, where, before her wounded viscera could be repaired and replaced and her abdomen closed, half her omentum had to be amputated.

As illustrations of insusceptibility or indifference to microbial infection the author gives the following:—

Among thousands of patients treated at one of the Bangkok hospitals the author has met with but two cases of typhoid fever, although in a series of 600 Widal tests 15·5 per cent. were positive. Bacillary dysentery is comparatively rare, and though amoebic dysentery is significantly common the author has observed only four cases of liver abscess. Smallpox in unprotected persons is not frequent nowadays in Bangkok, and the cases are mild. Although plague has been endemic for many years there have been since 1904 only 1,722 cases in a population of over 600,000. In a single year there were four recoveries (under treatment, of course) out of seven cases of fully-developed tetanus. Primary and secondary syphilis are rampant, but tertiary affections of the nervous system are extremely rare: the virus of the locality, however, is fully potent against Europeans. In malaria again, though infection may be demonstrated in 20 per cent. of patients attending clinics, the author has seen but eight cases of cerebral malaria, one of them being a multiple neuritis.

From his observations of cholera the author constructs a more elaborate argument: in Bangkok the population of the eastern side of the river is supplied with pure water by modern plant, whereas that of the western side drinks the liquid iniquity in its native sources; naturally the percentage of cases and of deaths from cholera in the last epidemic was much higher on the unblest western side, but yet the case-mortality was somewhat higher on the eastern side. [But here the line of argument becomes deflected.]

Even in the case of tuberculosis "a corrected pulmonary death-rate of 9·5 per cent. is not to be considered alarming under existing conditions" of insensibility to the elemental truths of sanitation.

The author in all his observations is specially impressed by the insusceptibility of the nervous system, and the more so because in beriberi, which stands apart as a deficiency disease, the nervous manifestations are conspicuous in Siamese cases.

A. A.

CASTELLANI (Aldo) & Taylor (Frank E.). **Further Researches on the Identification of Inulin and Maltose, by a Mycological Method. Cases of Maltosuria.**—*Jl. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 26. No. 4. pp. 59–62. [4 refs.]

In previous papers the authors have described a mycological method for the identification of various carbohydrates. Here they apply this method to the determination of inulin and maltose. Thus, *Monilia macedoniensis* Castellani ferments inulin with large production of gas; since it is one of the few organisms which affects this sugar, it is only necessary to inoculate tubes containing the doubtful substance, one with *M. macedoniensis*, another with an organism which does not ferment inulin to determine whether inulin is present. Similarly with maltose. The authors have seen several cases of maltosuria and describe one in a teaplanter who had a reducing substance in his urine and had been told he had glycosuria.

A. G. B.

ROY (Ashutosh). **The Merits of the Ayurvedic System of Medicine.**—*Indian Med. Gaz.* 1923. Feb. Vol. 58. No. 2. pp. 66–68.

The author, who is a practitioner of western medicine, expresses the opinion that at certain points, particularly in the first principles of pathogeny, in pharmaceutic material, and in dietetic therapy, the

Ayurvedic system of medicine is not surpassed, to say the least, by modern systems.

As regards the first point he tells us that, according to the Ayurved, health is the result of concord, disease the expression of discord, between *vayu, pittya,* and *kaphya,* and—though here his language is uncertain—that *vayu* represents the nervous system (both axial and sympathetic) and that pittya and kaphya are antagonistic humours, which humours he identifies with hormones. "The theory and practice of Ayurvedic medicine may therefore be summed up in one chapter only of scientific medicine dealing with the sympathetic endocrine system."

As regard the second point, he gives chaulmoogra oil as an illustration of the more reasonable proposition that the Indian materia medica includes, and possibly in considerable number, drugs worthy of more extensive use in medical practice.

The dietetic management of particular disease in the Ayurvedic system is a subject fit for study by western practitioners ; its importance is widely and deeply realized in India.

A. A.

FLEISHER (Moyer S.) & WACHOWIAK (M.). **The Presence of Yeast-Like Bodies in the Blood of Human Beings.—A Preliminary Report.** —*Amer. Jl. Trop. Med.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 59–68. With 4 figs. [11 refs.]

The authors state that they have found yeast-like organisms in the blood, as well as in the faeces, of three patients suffering from chronic diarrhoea. One of the cases had been definitely diagnosed as sprue, the other two did not show any of the characteristic signs of sprue and had been conjecturally relegated to tuberculosis. The organisms in each of the three cases, and from both sources, were cultivated in Sabouraud's test media ; " a considerable time " (one to three weeks) was required for any conspicuous growth. Cultures were administered to rabbits, either in food or by stomach-tube, in considerable quantities. Of eight (2+3+3) rabbits so treated six are stated to have suffered more or less from diarrhoea, which in one case was fatal, while the other two died, presumably after diarrhoea, though it is not so stated ; the organisms were recovered both from the blood and the faeces (or intestine) in five of them, from the intestine only in two, and from lung and liver and intestine in one.

The organisms of the three original human cases are not quite identical but differ in shape and also in the character of the mycelium that they all form.

[The original material in the first case consisted of " a specimen of stool " and " a blood culture taken at the same time " ; in the other two cases nothing is said as to how the material examined was obtained. Furthermore, nothing is said of any " control " of the conditions of the feeding experiments.]

A. A.

MACFARLANE (H. N.). **Acute Abdomens in Natives.** [Correspondence.] —*S. African Med. Rec.* 1923. May 26. Vol. 21. No. 10. pp. 238–239.

In Basutoland in 1922, 270 abdominal operations were performed, of which 109 (64 native) were for appendectomy, 24 for hysterectomy, 54 for removal of ovaries and tubes and 10 for radical cure of hernia.

The large number of appendix cases may be due to civilization or surgical opportunity, but it does not support the opinion that appendicitis is rare in natives. The author finds that the "native abdomen" behaves in much the same way as the European.

A. G. B.

ROBINEAU. **L'administration du néosalvarsan chez les enfants par la voie rectale.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21. No. 1. pp. 75-76.

Owing to the difficulties of intravenous or intramuscular injection in children the author gives neosalvarsan to them by the rectum. He uses a 2 cc. glass syringe and a No. 12 red rubber catheter shortened to 12-15 cm. The neosalvarsan solution is 1 : 10. Care is taken not to admit air and to inject slowly. No fluid has ever been returned. Twenty-one children have received 115 injections without mishap and with results not inferior to those of intravenous injection.

A. G. B.

LAMSON (Paul D.) & MCLEAN (A. J.). **The Toxicity of Carbon Tetrachloride in Relation to Liver Function as Tested by Phenoltetrachlorphthalein.**—*Jl. Pharm. & Experim. Therap.* 1923. May. Vol. 21. No. 4. pp. 237-246. With 3 figs. [17 refs.]

Since cases of intoxication by carbon tetrachloride have been reported, usually in chronic alcoholics and after a lapse of 36-48 hours, the authors made experiments on dogs to ascertain the minimum toxic dose, making use of the liver test of ROSENTHAL (1922), in which the rapidity of disappearance of phenoltetrachlorphthalein from the blood plasma is used as an index of hepatic function. They found that single doses of 4 cc. of carbon tetrachloride per kilo produce functional disturbance of the dog's liver with complete return to normal within 96 hours. Signs of intoxication could be observed before there were any visible signs or symptoms. Administration of 2 cc. per kilo produced no demonstrable disturbance of liver function. Finally, the 4 cc. dose given divided at 48-hour intervals was found to have no toxic effect, which is contrary to the belief that divided doses are more toxic than a single massive dose.

A. G. B.

KNIPPING (H. W.). **Ueber die Wärmebilanz des Tropenbewohners.** [The Heat Balance Sheet of the Tropical Resident.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. June. Vol. 27. No. 5. pp. 169-178. [28 refs.]

The importance of this question for colonists is obvious, and its scientific interest is signalized by the extensive bibliography appended. The author summarizes his observations by saying that the physical work capable of being performed is the same whether the workers are Europeans or those born in the tropics. The colour of the skin makes no difference in the heat balance sheet. The actual amount of work performed by Europeans or black people in different climates is another question and is not discussed. It is difficult to believe that the pigmented skin is not more favourable to existence in hot climates. Although black skin reflects less than half the amount of rays than does white skin, the author believes that this is compensated for by more ready loss of heat. No reference is made to Leonard HILL's work on this question.

Barring this difficulty nothing is advanced in this paper which militates against the usual physiological tenets on the question. The moisture and movement of the atmosphere which the author alludes to are undoubted factors in the regulation both of body heat and metabolism.

W. D. Halliburton.

MÜLLER (H.). **The Aorta of Malay Men.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 3. pp. 167–185. With 2 diagrams. [19 refs.]

From the examination in Java of 110 corpses of Malays, which term includes Javanese, Sundanese and Madurese, the author concludes that the aorta of Malay men is much too narrow both relatively and absolutely in proportion to bodily height and weight of heart when compared with European measurements and gives a series of tables and charts in support of this statement. He speaks of a " physiological hypoplasy of the blood-vessels." He suggests that status lymphaticus may be frequent in Malays and notes that it is so in the Philippines (CROWELL), the inhabitants of which much resemble Malays : in these cases the size of the aorta was " below normal."

A. G. B.

CHOPRA (R. N.), in collaboration with GHOSH (Sudhamoy), GHOSH (B. N.) & DE (P.). **The Pharmacology and Therapeutics of** *Boerhaavia diffusa* **(Punarnava).**—*Indian Med. Gaz.* 1923. May. Vol. 58. No. 5. pp. 203–208. With 7 graphs and 3 charts. [5 refs.]

Boerhaavia diffusa is a troublesome weed in India, used for dropsy in indigenous medicine from time immemorial. As a result of their experiments on animals and administration to 34 cases of oedema and ascites, notes of five of which are given, the authors reach these conclusions :—

The active principle is an alkaloid named *punarnavine* ; the plant contains also large quantities of nitrate of potash and other potassium salts. Intravenous injection of the alkaloid in cats produces a persistent rise of blood-pressure and marked diuresis, due mainly to action on the renal epithelium, though the rise of blood-pressure may contribute. One to four drachms of the liquid extract made from the dry or fresh plant produce diuresis in cases of oedema and ascites especially those due to early liver, peritoneal and kidney conditions. The potassium salts are considered to reinforce the action of the alkaloid.

A. G. B.

BOULAY (A.). **Mode simplifié de préparation des éthers éthyliques de l'huile de Chaulmoogra.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 151–154. [7 refs.]

This simple method of preparing ethylic ethers of chaulmoogra oil in default of a chemical laboratory is described as being a modification of HALLER's method. Ten grammes of the oil and 100 gm. of ethyl alcohol of 95° containing 4 per cent. of HCl are placed in a flask and cautiously warmed from refrigeration point. The mass becomes brownish-green and homogeneous, and at the end of two hours the operation is stopped. The uncombined alcohol is then driven off in a hot water-bath, and the liquid remaining in the flask is poured into about 50 cc. of hot water.

The ethylic ethers float as a greenish-black oily liquid, which has to be washed with hot water until all trace of acidity has disappeared. The product thus obtained has the characters of the others obtained by the saponification method of BLOCH and BOUVELOT; it has the characteristic slightly nauseous odour of chaulmoogra, and it is perfectly well borne in intramuscular injection.

A. A.

VAN LOON (F. H.). **Acute Confusional Insanity in the Dutch East Indies.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 200–220. [5 refs.]

In this interesting paper Dr. van Loon deals with the matter of acute confusional insanity as he has observed it in the Emergency Asylum for the Insane at Batavia, and particularly with the relationship of the psychosis to malarial infection.

In his opening he outlines the difficulties which have existed in the past for the investigation of mental disorders among the Malay races and laments the paucity of the recorded information on the subject; but this is only to be expected in a country where law and social order are comparatively recent acquisitions, and the fact that his present paper has come to be written is a striking testimony to the advance in efficiency of the civil administration of the Dependency. It is a safe generalization that scientific psychiatry can have no place save under the wing of a settled social order; before that is established, aberrant conduct, which is the material of the psychiatrist, needs must be dealt with on the broad principles of the legal code and, in an immature community, such a code is usually simple and provides but a short shrift for the asocial individual.

The author describes two main types of confusional psychosis: one, a very acute condition of short duration with much motor activity accompanied by hallucinations and illusions of personality and dominated by an affective tone of anxiety or fear, and the other a more prolonged disturbance with general motor restlessness without any dominant fear affect, and in the course of which the patient may develop signs of other mental groupings as stupors, catalepsy, etc. These two types would appear, to the reviewer, to approximate to what would be termed acute delirious mania and toxic confusional or exhaustion insanity respectively. Here it may be remarked that the paper would have been a little more easily read had the author made it clear that "confusion" when found in a mental case has a value comparable to that of a physical sign in bodily disorder, and may be taken to indicate a gross physiological disturbance of the neural basis of mental activity whether it be one due to exhaustion from prolonged reactive stress, to toxins circulating in the blood stream, or to any local interference with the metabolism or nutrition of the neural tissue by accumulations of parasites or whatever trauma may exist. The term Confusional Insanity is, therefore, somewhat misleading unless this is borne in mind, for such a differentiation can be only symptomatic. In cases where there is no actual destruction due to disease or trauma, such as occurs in general paralysis or gross brain injuries, confusion is a passing phase; patients who survive the attack either recover their mental balance or pass on to the exhibition of symptoms of the true psychoses which are essentially mal-adaptations to the environmental circumstances. It is doubtful if Dr. van Loon quite realizes this point, for, in the etiological division of his clinical material, he separates out a class (C) consisting of cases which progressed to show other psychotic manifestations after the acute confusional disturbance had subsided, and regards the whole sequence of phenomena as due to such other psychoses instead of taking the confusional phase as evidencing the addition of a toxic or exhaustion factor masking the true underlying psychosis.

However, apart from this criticism, which does not really affect the clinical value of the paper, the author found definite evidence of infective origin in 274 out of 333 cases of acute confusion admitted to the institution under his care, and of these 166 suffered from malaria, 76 from syphilis in one or other form, while the remainder gave evidence of such infections as pneumonia, typhoid, cerebrospinal fever, etc. The question of the relation of the mental disturbance to the infection is dealt with at length, but in the case of the malarial patients particularly a striking dependence of the mental symptoms on the course of the febrile disturbance is clearly indicated. The observations recorded are very valuable and should throw considerable light on the causation of the " running amok " which is found in the Malay and Indian races. From the psychological point of view the author considers that the prominence of the fear affect and the intensely vigorous defence reactions characteristic of the confusional state in the native are to be explained by the comparatively simple mental organization of the race, and he regards the conduct of the amok runner as an extreme type of fear response. As he rightly points out, the possibility of the condition being a confusional state which is amenable to treatment should be borne in mind when such an outbreak of violence occurs and the patient should be saved, if possible, from the usual treatment meted out which is that of " laying him down " as the natives express it, and which commonly takes the form of shooting the unfortunate victim at sight.

In thus drawing attention to the possible underlying physical factors in the case of acute confusion the author is performing a valuable service, for it is far too common an experience to find that the ordinary practitioner, and indeed the specialist in any other branch of medicine, is prone to lose all interest in a patient who is exhibiting signs of mental disorder; and, in his findings among the native population of the Malay States, Dr. van Loon is confirming a trend of opinion in regard to many mental states which are under review in more civilized countries. Malaria, as a cause of acute confusion, is rare in this country, though curiously enough the reviewer recently saw a case in which malaria was a highly contributing agent, but the relation of the rather obscure encephalitis to the manifestations of this type of mental disorder is a matter which is assuming an ever increasing importance to the medical profession here.

Thomas Beaton.

i. Levaditi (C.) & Nicolau (S.). **Propriétés physiques des ultravirus neurotropes.**—*C. R. Soc. Biol.* 1923. Jan. 20. Vol. 88. No. 2. pp. 66-69. [1 ref.]

ii. —— & ——. **Filtration des ultravirus neurotropes à travers les membranes en collodion.**—*C. R. Acad. Sci.* 1923. Mar. 5. Vol. 176. No. 10. pp. 717-720. [2 refs.]

i. The authors give here a résumé of their experiments on the adsorption, dialysis, and attraction by precipitins of soluble ferments, of the neurotropic

" ultraviruses " (neurovaccine, encephalitic and rabic viruses). From these experiments they infer that these ultraviruses appear to be composed of living proteid entities whose dimensions seem not much to surpass the dimensions of the albuminoid aggregates that carry diastases and bacterial toxins. They are adsorbed by the same suspensions that fix soluble ferments, toxins, and certain colourants. They attach themselves to serum-globulins which they bring down in their precipitation by dialysis. Thus the ultra-viruses on the one hand, and the soluble ferments and bacterial toxins on the other, have physical properties of the colloidal class in common.

The authors promise to show that, under pressure, the specific germs of all the neurotropic ectodermoses (see this *Bulletin*, Vol. 20, p. 680) pass collodion membranes that wholly or partly arrest albumins, certain soluble ferments and toxins, alexin and the haemolytic amboceptor, but that are permeable by peptones, amino-acids, and D'HERELLE's bacteriophage.

From the practical standpoint the authors conclude that the difficult filtration of certain neurotropic ultraviruses (*e.g.* vaccine) through filter candles is not due to the size of the germs in proportion to the pores of the candles, but to adsorption of the germs by the materials that compose the wall of the filter.

ii. In this communication the authors record their inferences from further experimental work. They show that in the case of filtration through collodion membranes the filtrability of the neurotropic ultraviruses —always reluctant—varies with different membranes and also with the specific nature of the virus, the permeability being greatest in the case of vaccine and successively less and less with the viruses of herpes, rabies, and encephalitis. They offer the explanation that among these viruses, as among other microbes, there must be, in every species, individual differences in size, and that the specific virus that includes the largest number of small individuals will be the most permeable for collodion membranes.

A. A.

PETIT (Albert). **Remarques sur la structure de quelques Bactéries.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Vol. 3. No. 1. pp. 71–81. With 1 plate. [2 refs.]

Using more or less familiar fixatives and staining methods and a Zeiss 1·5 mm. apochromatic objective with a No. 12 compensating eye-piece, the author has studied the structure of nine species of Bacteria, including *Bacillus subtilis, pestis, tuberculosis, paratuberculosis* and five unidentified species representative of filamentous, encapsulated and coccus types, and the following is a summary of his results :—

Bacillus tuberculosis and paratuberculosis alone possess a central body staining deeply with iron-haematoxylin and safranin and having the appearance of a nucleus, thus confirming, or justifying, the view that these two species are related to the Fungi, particularly to Actinomyces.

The Streptococcus examined possesses, besides scattered chromophil granules a central " chromatic " mass which divides simultaneously with the cell and to some extent resembles the central body of the Confervoid Nostoc.

None of the other species examined gave evidence of the existence of a nucleus ; but all contained chromophil granules—possibly chromatin—scattered in the cytoplasm.

A. A

SCHILLING (Viktor). **Das Hämogramm in der Tropenpraxis.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Feb. Vol. 27. No. 1. pp. 1–12. With 2 charts in text. [11 refs.]

To emphasize and illustrate in a Journal of Tropical Medicine the value, from every standpoint, of routine examination of the blood is to exhort the converted. The author's haemogram is a standard formula for recording in every case of disease, the clinical diagnosis, the total and the differential leucocyte counts—the latter in very particular detail, the erythrocyte phenomena, and parasites or other unusual elements. As the author says, such simple obvious formulated records furnish in the course of time data of the highest scientific and practical interest.

A. A.

i. ACTON (Hugh W.). **Medical Research, its Aims and Economic Value.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. pp. 124–127.

ii. HYVERT (R.). **Cure thermale de Pougues et maladies des pays chauds.**—*Rev. Prat. Malad. des Pays Chauds.* Paris. 1923. Apr. pp. 185–188. [4 refs.]

iii. RIBADEAU-DUMAS (L.). **La chaleur et les troubles digestifs du nourrisson.**—*Ibid.* pp. 167–179.

iv. HARTMANN-KEPPEL (G. L.). **La révulsion dans la pratique médicale populaire des Orientaux.**—*Rev. Méd. et Hyg. Trop.* 1923. Mar.–Apr. Vol. 15. No. 2. pp. 44–54. With 1 text-fig.

v. MEDICAL JOURNAL OF AUSTRALIA. 1923. Apr. 14. Vol. 1. Year 10. No. 15. pp. 398–400. **The Australian Institute of Tropical Medicine.**

vi. MOSHKOVSKY (Sh.). **The Moscow Tropical Institute.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 225–231.

vii. YAKIMOFF (W. L.), JOUKOWSKY (A.) & SCHIRWIND (S.). **A propos de l'angine de Vincent.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 236–238. [1 ref.]

viii. DELAMARE (Gabriel). **Morve humaine. Sur un cas de farcin chronique de l'homme à types successifs de malaria, d'arthralgies cryptogénétiques, d'infection nodulaire et de suppuration tenace, diffuse.**—*Rev. Prat. Malad. des Pays Chauds.* Paris. 1923. Apr. pp. 123–133. [2 refs.] Also in *Bull. sanitaire de Constantinople.* 1923. Feb. Nos. 7 & 8. pp. 63–68.

ix. HUDELLET (G.). **Volumineux fibrome naso-pharyngien.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 278–280. With 1 text fig.

x. HUDELLET (G.). **Epithélioma de la paupière.**—*Ibid.* pp. 270–271. With 1 text-fig.

i. An interesting address given at the Medical Research Section of the Indian Science Congress, January, 1923.

ii. Pougues-les-Eaux is an old spa in Central France. It is claimed that subjects of malaria and other tropical diseases do well there.

iii. Discusses heat stroke, summer diarrhoea, and "infantile cholera" and their treatment.

iv. Various forms of counter-irritation practised in the East, as by tattooing, cautery and fixation abscess, are here described.

v. The control of the Australian Institute of Tropical Medicine founded in 1907–8 was in 1921 transferred to the Commonwealth Department of Health. An account is here given of its reorganization and enlarged aims.

vi. See this *Bulletin*, Vol. 20, p. 18. The present version contains also a brief account of papers read at conferences during the first half of 1922.

vii. Twelve cases of Vincent's angina were seen between Moscow and Petrograd. Details of three are given; the Bordet-Gengou reaction was negative.

viii. A more detailed account of a case already reported, and summarized in this *Bulletin*, Vol. 20, p. 42.

ix. The tumour, of 11 months' growth, filled the naso-pharynx and had invaded neighbouring regions, thrusting the eyeballs out of their sockets and producing frightful deformity of the face. The patient, a native of Dakar, succumbed at the operation. The growth proved to be a fibro-sarcoma.

x. In a West African native, of whom a photograph is given. The tumour, which had caused the atrophy of the ocular globe, is described as "épithélioma pavimenteux tubulé."

A. G. B.

REVIEWS AND NOTICES.

NAPIER (L. Everard) [M.R.C.S., L.R.C.P. (Lond.), in charge of Kala Azar Research, Calcutta School of Tropical Medicine.] & MUIR (Ernest), [M.D., F.R.C.S. (Ed.)]. **Kala Azar. A Handbook for Students and Practitioners.**—pp. vi + 160. With 9 plates, 1 map & 6 charts. 1923. London, Bombay, Madras, Calcutta: Humphrey Milford, Oxford University Press. [Price 8*s*. 6*d*.]

The six chapters of this little book, which is designed for the student and general practitioner, give a remarkably clear and complete account of kala azar—its history and epidemiology, aetiology, clinical aspects, pathology, diagnosis, and treatment, as well as the necessary details for carrying out the all-essential procedures of the laboratory in the diagnostic investigation of this disease.

In the chapter on epidemiology the map illustrating the distribution of the disease in India is a particularly neat feature. In the account of aetiology the various views and conjectures as to the routes and agencies of transmission are very clearly and judiciously discussed. The chapter on symptoms is comprehensive but wonderfully concise; the general aspects and relations of all possible symptoms are considered, but the points of diagnostic value are always brought into relief. Complications and sequelae are dealt with in the same chapter, and here the authors (in consonance with KNOWLES) note their dissent from the view that skin lesions occurring in kala azar have any kindred with those of *Leishmania tropica*. In the chapter on pathology, methods of laboratory technique are included and serum tests are described. The authors write at some length but with good sense of Napier's own aldehyde test, the reliability of which appears to depend in some mysterious way upon season: in the cold season the percentage of confirmed kala azar cases in which it gave a negative result was between 12 and 15, whereas in the hot season the percentage of negative results in a large number of cases was only about 2, and that of positives about 98. In respect of spleen-puncture, the operation for which is very fully described, the opinion is expressed that, provided the patient is under hospital control for the time being, there are few contra-indications. The chapter on diagnosis is short but discriminative. Although all the points in clinical diagnosis are carefully propounded, and although the authors allow that an experienced clinician will make a correct diagnosis ninety times out of a hundred, they consider that a final diagnosis solely on clinical phenomena is "unjustifiable," They are equally emphatic in their opinion that an "absolutely definite diagnosis" should be made before treatment is begun. In the excellent chapter on treatment specific treatment by antimony tartrates naturally receives most attention. The authors admit that nothing is known of the way in which the tartrates of antimony act upon the parasite, that they will not cure every case, that they sometimes have disagreeable effects, and that the course of treatment is protracted, but they are convinced that the elimination of these objections is only a matter of further bio-chemical and pharmacological study.

It remains to be said of the book as a whole that it is superlatively clear and terse, assiduously methodical without a touch of pedantry, and precise without a trace of dogmatism, also that it is well illustrated (though the coloured plate viii is below the general standard), well-documented, sufficiently indexed, well-printed, and well got up.

A. Alcock.

Brug (S. L.). **De Parasitologische Diagnostiek van de Menschelijke Faeces.** [Parasitological Diagnosis of Human Faeces.] 8vo. pp. iv + 75. With 12 plates. 1922. Batavia: Javasche Boekhandel en Drukkerij.

In 1918 the author of the present manual—who is now Director of the Central Military Laboratory at Weltevreden—published a small book (in Dutch) on "The Parasitic Protozoa of the Human Intestine." The work under review constitutes a second edition of this earlier publication; but at the same time the scope of the work has been somewhat modified, so that it now deals not only with the parasitic protozoa, but also with the worm-eggs which may be found in human faeces. In spite of the additions to the text and figures, however, the author has been able—by omissions and other alterations—to keep the whole work within the same compass as the original edition. Though the brochure is evidently designed chiefly for the use of workers in the Dutch East Indies, it should form a useful addition to any tropical laboratory where the Dutch language is understood.

The present work consists of two parts of unequal length: the first (pp. 1–60) dealing with the Protozoa, and covering the same ground as the earlier edition; the second (pp. 61–67) dealing with some practical points in the examination of human stools for the presence of the eggs of parasitic helminths. There is finally a short list of references to some of the more recent publications bearing on the subjects handled in the text, and an index of some five pages. The 12 half-tone plates, with which the text is elucidated, display several additions to, and improvements upon, those of the previous edition. Plates XI and XII show the worm-eggs commonly seen in human excreta, and are wholly new, though the figures are not wholly original.

In the section dealing with protozoa the following subjects are successively considered: the technique of faecal examination, generalities concerning intestinal protozoa and classification, intestinal amoebae (five species recognized) and the diagnosis of amoebic dysentery, intestinal flagellates (three species), *Balantidium coli*, coccidia. Supplementary sections deal shortly with *Blastocystis*, "pseudoparasitism," and the "yeast-cells" which may occur in human faeces. The section on worms describes very briefly—after a few preliminary remarks—the eggs of Nematodes (six species), Trematodes (four species), and Cestodes (three species). Very little is said of the worms themselves, and it seems a pity that the very interesting—and often economically important—life-histories of some of these organisms are not even mentioned.

It would be unfair to criticize this little work as though it were a zoological textbook intended for general use. Nevertheless, the reviewer may note the following points, which he thinks the author might profitably reconsider in the event of a third edition of his work being called for. (1) The proposition that the intestinal amoebae of man belong to only two genera (p. 12) can hardly be regarded as tenable at the present day, and the genus *Dientamoeba* is surely worthy of at least passing notice—even if it has not yet been seen in the East Indies. (2) Some of the rarer flagellates might also be allowed a little notice; and it is now certainly desirable, if *Eimeria snijdersi* is mentioned, to notice *E. oxyspora* as well. (3) It might profit the author, further, to reconsider the matter of zoological nomenclature. He is evidently no lover of the "nomenclature purist" and the "superprotozoologist"; but if he would study the rules of nomenclature more carefully and consider their object, he might perhaps see his way to follow them more closely in future. It may be true that specialists in zoological nomenclature have sometimes introduced chaos and confusion into what appeared to be an orderly system; but it is also true that anarchy is not usually conducive to a settled state of things. The perpetuation of names such as *Lamblia intestinalis* and *Trichomonas intestinalis* really does not make for clarity; while the application of *Bodo* and *Prowazekia* (which are really two names for the same thing) to two different organisms unquestionably leads to confusion. The retention of the name "*Amoeba limax*" is also to be deplored, since it is one which has become practically meaningless to the specialist on this group of organisms. (4) The reviewer also thinks that the author might with advantage reconsider the evidence upon which the species "*Entamoeba tenuis*" rests, though he is well aware that this suggestion is not likely to be warmly received. It seems to the reviewer that the Dutch workers, in general, have not appreciated to the full all the evidence which speaks in favour of including this "species" under the synonyms of *E. histolytica.*

A considerable number of misprints and mistakes occur in the list of references (pp. 68, 69) and these will require correction in a future edition. There are also many misprints of less importance—rather too many for a revised version—in the text (*e.g.*, on p. 6 "kleurig met ijzerhaemotoxyline" (for kleuring met ijzerhaematoxyline), on p. 11 "flagellae" (for flagella), p. 20 "Braun'sche beweging" (for Brown'sche—a phenomenon named after the English botanist, not the German parasitologist), p. 21 "Koidzuma" (for Koidzumi), p. 39 "*Iodamoeba bütschli*" (for *bütschlii*), p. 46 "Fanapepa" (for *Fanapepea*) and "cystostoom" (for cytostoom), Pl. XII "*Opistorchis*" (for *Opisthorchis*), etc.). As regards the figures, Fig. 1 (Pl. I) is not easily identifiable as a portrait of *E. coli*; and none of the figures of *E. histolytica* can be said to show the normal structure of the nucleus correctly, while the "minuta forms" containing starch grains (?) appear to have been drawn, more probably, from small specimens of *E. coli*, and the "uninucleate cyst of *E. histolytica*" (Fig. 2, Pl. V) is also much more like a cyst of *E. coli*. The nuclei of *Iodamoeba* (called "*Endolimax williamsi*") are not, in the reviewer's opinion, correctly delineated in the figures on Pl. VII; the figures of *Trichomonas* and *Chilomastix* (Pl. IX) do not show the structure of these complicated flagellates in accurate detail; and the figure of *Balantidium coli*, on the same plate, shows the anterior contractile vacuole lying ventrally (instead of dorsally, as it should), and does not exhibit the micronucleus. Greater accuracy in these and other matters of detail would enhance the value of the work as a whole, and would help to increase its usefulness to others besides those to whom it is more particularly addressed.

Clifford Dobell.

JENKINS (Charles F.). **Tortola. A Quaker Experiment of Long Ago in the Tropics.**—106 pp. With 8 plates. 1923. London: Friends' Bookshop, 140, Bishopsgate, E.C.2. [Price 5*s*.]

To those who think of them at all, the Virgin Islands are ever memorable as the background of a scene in the last sorrowful act of the life-drama of the imperishable DRAKE: it was from a secret roadstead of the Virgin Islands that the hero of the Armada and of the Spanish Main delivered the unsuccessful assault on Puerto Rico that preluded the attack of dysentery which suddenly extinguished the mortal part of him. The author of the present little epic of Tortola, one of the larger of those of the Virgin Islands that appertain to the British crown, reminds us that a little islet off the coast of Tortola was the stage upon which the famous John LETTSOM, founder of the Medical Society of London, mewled in his nurse's arms, and gives us a very interesting account of the scenes and circumstances amid which that versatile man and his worthy fellows of the Society of Friends played some of their parts. When, after much struggling between Spaniards and English and Dutch and French, certain

of the Virgin Islands, in 1672, finally settled under the British flag, they were not of much value, and it was only by incessant toil that a few English settlers from Antigua began in time to make them yield a little fruit. In 1727 a zealous Quaker missionary visited Tortola. He converted the governor, John PICKERING, and by the middle of the century Quakers were estimated to number about a tenth of the white population of the island. In the time of the Friends Tortola greatly flourished : the whole island blossomed like the rose, and its sugar and rum and cotton were carried afar over seas. In such worldly prosperous circumstances the conflict between high ethical professions and the lure of mammon was decided in the usual way, and Quakers grew rich on the sweat of negro slaves just like their ordinary fellow-Christians : John PICKERING, the wealthy ex-governor, was not the only man in Tortola who found it hard to reconcile the austerities of the Quaker code with the seductions of the primrose path.

It was in the fatness of these pursy times that John LETTSOM was born (in 1744), being, it is said, one of the seventh pair of twins brought into the world by his mother, but the only pair that lived. At the age of six he was sent to England to be educated, and there he came under ward of Samuel, brother of Dr. John FOTHERGILL. At the age of 23 he returned to Tortola, a partly qualified man, to claim his paternal inheritance. His first act was one of noble renunication—he set all his slaves free. After staying six months in his native land, during which, by the practice of his profession he realized £2,000, half of which he gave to his widowed mother, he went back to England, completed his medical education, and eventually succeeded to Dr. FOTHERGILL's practice in London.

Another Tortolan ornament of our profession was Dr. William THORNTON, grandson of John PICKERING on the maternal side and a friend and admirer of LETTSOM. He also, after being educated in England, practised for a time in Tortola, and he also not only set his negroes free but, furthermore, was hardly dissuaded from personally conducting them back to Africa. Eventually he betook himself to Philadelphia, where, being a talented artist and amateur architect, he submitted a design for the Capitol at Washington—and the Capitol of Washington actually "was erected substantially from his plans."

Towards the end of the 18th century Quakerism declined in Tortola. In 1772 and 1880 the island was devastated by terrible hurricanes and even the meeting houses were destroyed. In 1840 a party of the Friends visiting the island found many of the plantations abandoned and overgrown. When next visited by the Friends, in 1913, Tortola appeared almost uncultivated ; nothing was seen but ruins of houses and sugar-mills ; the very memory of Quakerism was extinct ; search for meeting-houses and ancestral tombs disclosed nothing but meagre ruins smothered in the dense undergrowth of resuscitated jungle : nature had resumed her ancient rights.

Since 1913 Tortola and her sister Virgins have recovered to some extent. Their exports, which presumably were at or near zero in 1913, were in 1921 valued at £24,344 (in 1788 they had been £164,128), some English settlers have reappeared (the number of whites in 1921 was 36), and considerable progress has been made in restoring the land to cultivation.

This interesting account of a West Indian islet, which, with an area of only 21 sq. miles, could support in lavish luxury a considerable population of white men and export in one year nearly £165,000 worth (at present values probably about £1,000,000 worth) of its produce, helps us to realize faintly what inexhaustible possibilities of wealth the British Empire possesses in the West Indian Islands, notwithstanding their hurricanes and other vicissitudes of great nature.

A. Alcock.

Hygiene and Disease in Eastern Tropical Africa. The Protection of Aircraft from the Attacks of Insects. Issued as a Supplement to the Handbook of German East Africa. Prepared on behalf of the Admiralty and the War Office. I.D.1055A.—58 pp. With 21 figs & 1 map. 1923. London: H.M. Stationery Office. [Price 2*s*. net.]

This is a wonderful booklet. It contains the large salient facts and principles of tropical pathology and hygiene in what, from its neatness and conciseness, might be called a " tabloid " form, but, from its pleasant aroma of terseness and commonsense, rather more resembles a quintessence. It has sections, with good figured illustrations, on theories of infection and protective vaccination, on general rules of health, and on the principal diseases of tropical Africa and their arthropod carriers, and there is a map. There is also a useful chapter on the protection of aircraft from termites and boring beetles.

The figure of the " instrument for treatment of snake-bite " is perhaps superfluous, that of ankylostoma might be improved, and that of *Anopheles funestus* elaborated. In a future edition figures might be given of eggs of Ankylostoma and Bilharzia, of shells of some common fresh-water snails, and also of *Stegomyia fasciata* seeing that it, rather than *Culex fatigans*, is the common carrier of dengue fever. The statement also that Bilharzia infections are incurable, which suggests that the text is a good deal older than the date appearing on the title-page, requires some mollification.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 20.] 1923. [No. 12.

HELMINTHIASIS.

KLIGLER (I. J.). **Helminthic Infection in Jerusalem.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 46–48.

Whilst in charge of the laboratory of the Rothschild Hospital the author encouraged local doctors to send stools from patients, irrespective of their malady. Examinations were also made of the inmates of two orphan asylums. In this way 2,369 stools (1,615 from adults and 754 from children) were examined during a period of eighteen months. The tabulated results may be accepted as characteristic for the Jewish population of Jerusalem.

Helminthic Infections in Jerusalem.

	1921.		1922.	
	Children.	Adults.	Children.	Adults.
	Number positive.	Number positive.	Number positive.	Number positive.
Ascaris	55 (51·4%)	238 (48·4%)	145 (62·7%)	101 (41·4%)
Trichiuris ..	31 (29·0%)	164 (33·3%)	53 (22·9%)	100 (40·9%)
T. nana.. ..	12 (11·2%)	19 (3·9%)	20 (8·6%)	6 (2·5%)
T. saginata ..	4 (3·7%)	56 (11·4%)	6 (2·6%)	22 (9·1%)
Oxyuris.. ..	4 (3·7%)	11 (2·2%)	6 (2·6%)	9 (3·6%)
Ancylostoma ..	1 (0·9%)	3 (0·6%)	1 (0·4%)	5 (2·0%)
Strongyloides ..	0 (0·0%)	1 (0·2%)	0 (0·0%)	1 (0·3%)
Total positive ..	107	492	231	244
Total of stools examined ..	270	1,074	484	541
Percentage positive	39·6	45·8	47·7	45·1

The very low incidence of ankylostome infection—less than one per cent.—is especially notable. Oxyuris was found in six out of eighteen consecutive examinations of appendices which came to the laboratory.

R. T. Leiper.

(12389) Wt.P.4/152 1500 12/23 Harrow. G.75

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Le parasitisme intestinal chez les indigènes de Léopoldville, Congo belge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May 1. Vol. 3. No. 1. pp. 45–52. With 1 graph in text. [2 refs.]

Figures of the prevalence of helminth infections in the Belgian Congo are given for the years 1900–15, taken from previous records, and in greater detail the findings of the authors themselves in 1920–22. The infections most frequently met with are ankylostome and ascaris. In 1900 at Léopoldville 50 per cent. of the children up to and including school age were harbouring ascarides and 77 per cent. had hookworm; in 1921 these were respectively 42·7 and 35·9 per cent., showing a reduction by more than half in the latter. Examination of 81 apparently healthy persons in a small village, Bas-Congo, revealed 67 with hookworm (82·77 per cent.) and 19 with ascaris (24·9 per cent.).

Treatment of hookworm seems to have been thorough, but reinfection soon occurred. The usual method was to give 1–2 gm. of thymol daily for four days followed by a similar course of naphthol, and then, without any interval, both these were repeated.

Schistosome infection, which in 1900 was recorded as present in 27 per cent., was in 1921 down to 4·5 per cent. No case of rectal schistosomiasis contracted in Léopoldville has been found, all having become infected in the eastern province.

R. T. L.

WATTS (R. C.). **A Note on a Helminth Survey of a Gurkha Battalion.** —*Lancet.* 1923. July 7. p. 15.

In this survey concentration methods were not used, but a loopful of faeces was simply dissolved in normal saline and examined under a coverslip. The results so obtained were as follows:—Cases examined, 561; cases infected, 139; giving ankylostomiasis, 8·5 per cent.; ascariasis, 12·2 per cent.; trichocephaliasis, 4·6 per cent. It was noted that (1) cases having infection without being inconvenienced or showing any signs whatever formed 81 per cent., (2) cases having some other disease which may mask signs of helminthic infection formed 17 per cent., (3) cases in which anaemia is marked formed 2 per cent.

All the parasites recovered belong to the species *Necator americanus.*

R. T. L.

FAUST (Ernest Carroll). **A Survey of the Helminth Parasites of Man in North China.**—*Trans. 4th Congress Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 476–481.

North China is located between two heavily infested regions, viz., Korea and Japan on the north and the Yangtze Valley in the south. It is commercially connected with both by land and water routes and the relatively low incidence of helminth infections in man and the indigenous animals requires explanation. The author has sought this in a comparative study of hospital records and of seasonal incidence. He concludes that the low incidence of infection in North China depends primarily upon the climatic conditions. With the exception of *S. japonicum* and *F. buski* all species of worms common to other areas of China have been reported from Peking. Clonorchis and Dibothriocephalus although rare in man in North China occur in dogs and cats in relatively large numbers. Viability of many species is decreased by the extreme desiccation which takes places during the greater part of the year in North China. In addition to climate, native customs introduce a selective factor. The paper gives a table showing the percentage of infection in various parts of China but omits the figures upon which these are based. [The general result would appear to be very fallacious.]

R. T. L.

KHALIL (M.). **On the Septic Tank in the Tropics: from a Helminthological Standpoint.**—*Report of the West Indian Medical Conference, held on July 6th, 1921.*—Reprinted in *London School of Trop. Med.* (*Dept. of Helminthology*). *Collected Papers.*—1922. Part 2. No. 16. 3 pp.

In this, one of the preliminary reports of the Filariasis Commission of the London School of Tropical Medicine which visited British Guiana in 1921, an account is given of the result of an enquiry into the helminth content of the effluents of a number of septic tanks in use in Georgetown and its neighbourhood. The most striking was that made at Tank No. 6, which gave an average output of 2,475 ankylostome eggs, 2,025 ascaris eggs and 225 free-living nematodes per gallon. The eggs in the effluent showed little or no development but were proved experimentally to be capable of normal development. It is inferred that the septic tank, as used in British Guiana, has no destructive action on the eggs of parasitic worms and that any value it may possess in controlling the spread of these infections lies in the concentration of infected faecal matter into one channel. A concluding paragraph states that $CuSO_4$ effectually neutralizes the offensive odour of the effluents.

R. T. L.

HALL (Maurice C.). **Notes on the Present Status of Anthelmintic Medication.**—*U.S. Nav. Med. Bull.* 1923. June. Vol. 18. No. 6. pp. 673-679.

The efficacy of the oleoresin of male fern and of kamala against *Fasciola hepatica* appears to depend in part on the blood-sucking habit of this fluke, as the nearly related *Dicrocoelium dendriticum* is unaffected. The claims to success in the medication for larval cestode infestations have not been substantiated for such drugs as male fern, neosalvarsan and novarsenobenzol. In trichinosis the serum of animals which had recovered from infection probably has antibodies which are of service in neutralizing certain helminth toxins responsible for part of the pathological conditions. No definite results have been obtained so far against *Filaria bancrofti* infection, but MACFIE reports success in the treatment of guineaworm by intravenous tartar emetic, and other writers have had similarly good results from the use of novarsenobenzol. One cc. of ascaridol, the most active constituent of oil of chenopodium, is apparently sufficient to remove ascarids from adult persons. In the treatment of hookworm by carbon tetrachloride, which was originally introduced by the author, a dose of 3 cc. appears to be safe and sufficiently effective to make larger doses inadvisable. " Recent studies indicate that the rather mild symptoms of discomfort which follow the drug are largely avoided if salts are given two or three hours after." It should not be given with castor oil, as this diminishes its efficacy. Santonin is more effective against ascarids in repeated small doses than in one large dose. At the present time aluminium compounds, in proprietary forms, are being advocated in Europe for the cure of oxyuris. In veterinary practice arecoline hydrobromide (⅛–¼ gr.) has been given to dogs with tapeworm, and a case is mentioned in which an adult person passed a tapeworm after a dose of one thirty-second of a grain. This drug requires no purgative as it is in itself purging in action.

R. T. L.

KEUKENSCHRIJVER (N. C.). **Wormziektebehandeling met een mengsel van tetrachloorkoolstof en oleum chenopodii.** [Treatment of Worm Disease with a Mixture of Carbon Tetrachloride and Chenopodium Oil.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 474–480. With 3 text figs.

Reports on 20,000 cures with a mixture of seven parts carbon tetrachloride and one part chenopodium oil without any untoward effects. Storing of the mixture increases its toxicity; it should be freshly prepared before use. It expels 97 per cent. of the round-worms, and is therefore especially recommended in regions where heavy ascaris and hookworm infection coexist.

For the sake of elimination of soil pollution the author recommends the erection of permanent latrines at the coolie lines, a type of which is described. He also gives a sketch of an automatic tap.

W. J. Bais.

REED (J. G.). **Carbon Tetrachloride and Oil of Chenopodium in Helminthiasis.**—*Brit. Med. Jl.* 1923. June 23. pp. 1048–1049.

Carbon tetrachloride alone is a fairly efficient anthelmintic for ascaris but has a much higher efficiency and practically never fails when given in combination with oil of chenopodium, which is soluble in it. The drug appears to have no effect against trichocephalus and strongyloides. For adults the routine now followed by the author is:—One ounce of castor oil at night followed next morning by a mixture containing 1 drachm of carbon tetrachloride, 1 cc. of oil of chenopodium and ½ oz. of liquid paraffin. Almost all the patients complain of feeling drunk for a time varying from a few minutes to a day. As a rule three or four motions result within 24 hours and these often contain numerous ascaris worms. Occasionally slight vomiting, headache or pain in the abdomen occur. Notes are given of 6 cases out of 84 treated in which death, from one cause or another, occurred within a few weeks, and the post-mortem findings are briefly summarized.

R. T. L.

i. SUZUKI (S.). **On the Resistance of the Encysted Cercaria of** *Fasciolopsis buski.*—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1923. Mar. No. 227. [In Japanese. English summary, p. 3.]

ii. NAKAGAWA (Kōan) & SUZUKI (Sotowo). **Investigation of the Life-history of** *Fasciolopsis buski.* **(Second Report.)**—*Ibid.* May. No. 228. [In Japanese. English summary, p. 1.]

i. " The author examined the resistance of the encysted cercaria of *Fasciolopsis buski* against physical and chemical influences during the hot season of Formosa, viz., the three months August, September and October.

"The encysted cercaria, while more resistant than the egg owing to its structure, dies within a comparatively short time in salt water of more than 5 per cent., and saturated lime-water and soy." Its resistance against desiccation is not high, whereas the resistance against acids, *e.g.*, acetic or hydrochloride acid, is comparatively strong.

ii. *Fasciolopsis buski* thrives well in the pig. In experimental infections in other animals, *e.g.*, dogs, cats, guinea-pigs, rabbits, white rats, and goats, although capable of surviving the worms gradually fail in their growth and eventually die without completing their full development.

R. T. L.

KOBAYASHI (Harujiro). **A Distomid Larva infesting the Egyptian Mullet.**—*Jl. Helminthology.* 1923. July. Vol. 1. No. 3. pp. 97–98. With 1 text fig.

The Japanese mullet has been shown by ONCHI and NISHIO to be the second intermediate host of *Heterophyes nocens.* The author on his homeward journey from Europe purchased some Egyptian mullet in Port Said and found in them encysted cercariae. From the morphology and locality it is concluded that the encysted worms are the young of some species of *Heterophyes,* one closely allied to *H. heterophyes,* for the presence and position of the genital sucker is characteristic. The cysts are spherical and 0·16 mm. to 0·19 mm. in diameter. The cyst wall is moderately thick and tough. The enclosed distome is folded upon itself but when extended measures 0·2–0·46 mm. in length, and the surface of the body is covered with scale-like spines.

R. T. L.

KHALIL (M.). **A Preliminary Note on the Second Intermediate Host of** *Heterophyes* **in Egypt.**—*Jl. Helminthology.* 1923. July. Vol. 1. No. 3. pp. 141–142. With 3 figs. in text.

In the mullet, *Mugil cephalus,* from Lake Menzaleh encysted cercariae were found which resembled in their general anatomy the young of Heterophyes. Feeding experiments on cats have proved successful. Eight days later Heterophyes were found in the gut and on the 14th day after feeding eggs were passed. The adults were indistinguishable from *H. heterophyes.*

R. T. L.

HOFFMANN (W. H.) & GUERRA (A.). **Distoma hepático originando un absceso muscular.** [*Fasciola hepatica* causing a Muscle Abscess.] —*Rev. Med. y Cirug. Habana.* 1923. Aug. 25. Vol. 28. No. 16. pp. 558–561. With 2 figs.

The patient, a man of 30 years, by occupation a charcoal burner, was attacked suddenly with acute pain over the right costal margin and a swelling developed there in the course of three or four days. The condition was thought to be either a tuberculous abscess of the rib or a pointing liver abscess. When incised the pus proved to be in the muscle and an immature *Fasciola hepatica* was found. It measured only 5–6 mm. in length by 2 mm. in breadth.

H. Harold Scott.

i. KOSAKA (Keiji). **[On the Spread of Liver Distomiasis in Gifu Prefecture. II. Communication.]**—*Aichi Igakkai Zasshi* (*Jl. of Aichi Med. Soc.*). 1923. Jan. Vol. 30. No. 1. [Summarized in *Japan Med. World.* Tokyo. 1923. June 15. Vol. 3. No. 6. pp. 139–140.]

ii. ASAOKA (Ryutaro). **[On the Spread of Liver Distomiasis in Miye Prefecture. II. Communication.]**—*Ibid.* [Summarized in *Japan Med. World.* Tokyo. 1923. June 15. Vol. 3. No. 6. pp. 139–140.]

i. The author has looked for cercariae of *Clonorchis sinensis* in the fish living in all the rivers and brooks of the Gifu Prefecture and found the cercariae of the parasite in both its first and second intermediate hosts in the counties Inaba, Motosu, Ammpachi, Kaidzu, Fuwa, Yoro and Hajima.

ii. In the village Nagashima, in Miye Prefecture, 48 out of 411 (11·6 per cent.) of the school children were infested with *Clonorchis sinensis.* The first and second intermediate hosts and the cercaria of the parasite were detected in the village.

R. T. L.

CAWSTON (F. G.). **South African Larval Trematodes and their Intermediary Hosts.**—Reprinted from *Trans. Roy. Soc. S. Africa.* Vol. 11. pp. 119–130. [11 refs.]

From an examination of over 10,000 molluscs collected from rivers along the East Coast from Port Elizabeth to Lourenço Marques it would appear that there are at least 34 distinct species, including a few bivalves. The localities in which the molluscs have been found, the species of mollusc and the larval trematodes harboured by each species have been tabulated, thus giving in handy form much information already published in various communications by the author. A second table classifies the cercariae under the various systematic groups. [Many of the species named in this list are undoubtedly synonyms of forms described and named previously by LOOSS, SONSINO, and other observers. Thus, if *C. pigmentosa* be the cercaria of *Fasciola gigantica* it is synonymous with *C. obscura* Sonsino from the same mollusc]. Dr. K. SHARPE supplies the following useful information :—

" Along the south coast of Natal most of the smaller rivers and streams appear to be infected with Bilharzia. Amongst those that are definitely known to harbour this disease are the following : Umzimbi, Umtwalumi, Ifafa, Umzinto, Isezela, Umpambinyoni, Amahlongwe, Umquahumbi (a tributary of the Illovo river), Umlaas, Umhlatuzan and Umbilo rivers.

" The midlands appear to be fairly free from this infection, there being only two small rivers and one stream whose waters are known to harbour Bilharzia. These are the Umsindusi river, which is a tributary of the Umgeni, and which flows through the Maritzburg district. The Dorp Spruit, which feeds the Umsindusi, and the Sampofu river, running through the Umsinga district and a tributary of the Tugela river.

" In the districts along the north coast, Bilharzia infection seems to confine itself to a few of the smaller spruits. The Mazule stream and the Umkunyana stream near Melmoth are infected, and the spruits around Eshowe also are known to harbour the disease.

" In addition to the rivers mentioned above, there are a number of small streams which are suspected of harbouring the infection. Among these are the Palmiet stream, a tributary of the Umbilo river, the streams around Stanger, the Sinquasi river, the rivers in the Ginginhlovu district, that portion of the Umhlatuzi which flows through the N'Kandhla district, and all rivers and spruits around Dannhauser. The spruit running through Burnside Colliery is also suspected."

R. T. L.

CAWSTON (F. G.). **Possible Hosts for the Bilharzias in Portuguese East Africa.**—*Jl. Trop. Med. & Hyg.* 1923. July 2. Vol. 26. No. 13. pp. 228–229. [1 ref.]

At Beira, in Portuguese East Africa, immature specimens of an Isidora resembling *I. natalensis* and numerous specimens of *I. forskali* were found by the author, who had on the Northern Coast of Natal found *I. forskali* infested occasionally with a cercaria resembling that of *S. haematobium.* Schistosome infection of *Isidora* spp. is only very occasional in South Africa. The author suggests that as *Physopsis africana* occurs in Egypt it may act there as one of the intermediate hosts. [It must, however, be of great rarity if it occurs at all in Egypt.]

R. T. L.

CHESTERMAN (Clement C.). **Note sur la bilharziose dans la région de Stanleyville (Congo Belge).**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 73–75. With 2 figs.

At Yakusu, near Stanleyville, intestinal bilharziasis only occurs, and the cases show terminal spinal eggs somewhat more elongated that those typical of *S. haematobium.* The local intermediary host is very like if not identical with *Bullinus contortus.*

R. T. L.

LEGER (Marcel) & BÉDIER (E.). **Index bilharzien** (*Schistosomum haematobium*) **chez les enfants de Dakar.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 276–278. [6 refs.]

One hundred and ninety-five young negroes between 9 and 14 years of age from the schools of Dakar and its suburb, Medina, were examined for vesical bilharzial infection. Of 127 at Dakar, 8, *i.e.*, 6·3 per cent., passed ova of *S. haematobium.* No eggs were found in the faeces of any of these cases. In Medina, 26 out of 68 proved to be carriers, *i.e.*, 38·8 per cent. In 10 of these cases the eggs were numerous.

R. T. L.

HALL (A. H.). **Report on Bilharzia Disease in Basrah together with Notes on Treatment carried out.**—*Annual Administration Report of the 'Iraq Health Services for the year 1921.* pp. 58–59.

Dr. A. H. Hall's report on bilharzia infection in Basrah shows that about half of the population of school age suffers from the disease and about one-third of the adult working-class population. It appeared that Christian and Jewish children showed less susceptibility than Mohammedan children, and this was borne out by the comparative results of an examination of the pupils of the American School in 1922. In this, a mixed school, it was found that of the Mohammedan children 57 per cent. were infected, Christian children 30 per cent., and Jewish children 27 per cent. This is probably due, however, to the fact that they bathe in the creeks much less frequently than do the Mohammedan children. The incidence of the disease seems greater about the age of 8 or 9 years, and there is undoubted evidence of a tendency towards spontaneous cure. That 33 per cent. of a batch of civil prisoners were found infected shows, however, that the disease does persist to adult life. The masters maintain that they cannot get "full value" out of infected boys. The average age of the boys treated was 10, and the total dose of tartar emetic aimed at in these cases was 10 gr. Eggs disappeared from all uncomplicated cases after 6 gr., and even before that all symptoms had disappeared. The children were re-examined after nine months and in 33 per cent. the eggs had reappeared, but this may have been due to reinfection.

R. T. L.

CHRISTOPHERSON (J. B.). **Remarks upon a Photograph of an Endemic Focus of Bilharzia Disease in Portugal; Specimens of the Intermediary Host, *Planorbis dufourii* (Graells).**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1923. Aug. Vol. 16. No. 10. pp. 47–48.

The photograph (exhibited but not reproduced) showed the endemic focus at Tavira to be a natural excavation in limestone constantly filled from a thermal spring at a temperature of 25° C. At least 16 out of the 64 washerwomen who used this tank were infected with vesical bilharziasis. The tank is infested with *Planorbis dufourii*, and these have been found naturally infected. At Alportal, another endemic focus, situated near to Tavira, the river is the source of infection, and there the temperature of the water is only 13° C. No species of *Bullinus* has been recorded from Portugal. [*P. dufourii* is the mollusc recorded in earlier communications as *P. corneus* and *P. metidjensis*.]

R. T. L.

KHALIL (M.) & LEE (C. U.). **Bilharzia Infection in the New World.**—*Report of the West Indian Medical Conference held on July 8th, 1921.*—Reprinted in *London School of Trop. Med. (Dept. of Helminthology). Collected Papers.*—1922. Part 2. No. 17. 4 pp.

A preliminary account is given of the visit of Professor R. T. LEIPER and Dr. C. U. Lee to Dutch Guiana in 1921. *S. mansoni* was found endemic in the City of Paramaribo. *Planorbis olivaceus* occurred in the rice-fields on the outskirts of the city and in the freshwater trenches in some of the streets. Five per cent. of the Planorbis collected in the latter were naturally infected with the cercaria of *S. mansoni.*

With specimens taken to British Guiana the authors ascertained that $CuSO_4$ diluted to one part per million of rainwater was lethal, whereas 1 in 200,000 was the highest lethal dilution when the local canal water (Lamaha water) was used, due to the presence of humic acid and other organic substances in the water. Difficulties are related which arose in an attempt to eradicate a species of Planorbis commonly found in the Botanic Gardens in Georgetown.

R. T. L.

CAWSTON (F. G.). **Early Indications of Bilharzia Infestation.** [Correspondence.]—*S. African Med. Rec.* 1923. June 9. Vol. 21. No. 11. pp. 263–264. [4 refs.]

The author had become infected with *S. haematobium* during his investigations on the carriers of this fluke in South Africa. The migration of the young flukes from the skin through the lungs and other parts was attended by a temperature rising to 102° F., oppression on deep respiration and slight stabbing pains in the precordial region. X-rays later revealed an enlarged liver. The most marked sign was a heightened eosinophile count of 39·5 per cent. No ova were isolated until seven months later, when the eosinophilia had fallen to 12 per cent. Antimony treatment eradicated the infection, but an 11 per cent. eosinophilia persists although the antigen test usually becomes negative in a week or two; in the specific case it does not appear to have been made. [The author's experience will indicate the danger of inviting, through the press, farmers and laymen to collect snails for investigation purposes.]

R. T. L.

SINDERSON (H. C.) & MILLS (E. A.). **Rectal Papillomata in** *Schistosoma haematobium* **Infestations.**—*Brit. Med. Jl.* 1923. June 9. pp. 968–969. With 4 text figs.

The experience of the authors in Mesopotamia fully supports the observation that the ova of *S. haematobium* are to be found commonly in the faeces and that occasionally they form intestinal papillomata. In one case a polypoid growth was microscopically examined. The peripheral portion of the growth showed an advanced hypertrophic condition of the rectal glandular tissue, with the formation in places of long papillomatous prolongations of the mucosa. In certain superficial portions of the growth there is a tissue resembling granulation tissue in which numerous ova are present, blood-vessels are numerous and ulceration is apparently occurring. In the central portion of the growth glandular structure is entirely absent and the fibrous tissue elements show considerable increase, forming a well-marked stroma in which are embedded numerous ova. In the vicinity of ova containing miracidia, which stain well [presumably alive when fixed] the infiltrating cellular type, is the eosinophile cell; while in the neighbourhood of degenerating ova, evidenced by lack of nuclear staining, the mononuclear leucocyte is predominant.

R. T. L.

CHRISTOPHERSON (J. B.). **Specimens of (1)** *Schistosoma bovis* **and of its Snail Carrier; (2) the Intermediate Hosts of** *Schistosoma mansoni* **Brazil.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1923. Aug. Vol. 16. No. 10. p. 56.

1. The author quotes MILTON's suggestion that cases of rectal infection with *S. haematobium* without vesical symptoms—such as described by LOW, from Uganda, in 1907, and CHESTERMAN, recently, from the Belgian Congo, and CLAPIER, from French Congo—are possibly cases of *S. bovis*. The carrier of *S. bovis* in Natal is *Physopsis africana*.

2. The Brazilian intermediate hosts of *S. mansoni* (received from Prof. LUTZ) are *Planorbis olivaceus* and *P. centimetralis*—the latter being found infected in North Brazil.

R. T. L.

CAWSTON (F. G.). **Some Notes on the Differentiation of Closely-Allied Schistosomes.**—*Parasitology.* 1922. Dec. Vol. 14. Nos. 3 & 4. pp. 245–247. [9 refs.]

This short article contains nothing new and little that has not been published on previous occasions. The purpose of the author would appear to be the communication of the following table for the differentiation of " Schistosomes " in South Africa :—

		Approximate length of cercaria in mm.	Pairs of mucin glands in cercaria.
S. haematobium	(*C. crispa*) ..	0·52	3 acidophilic with large nuclei.
S. mansoni	(*C. spinosa* ?)	0·39	2 acidophilic with large nuclei. 4 basophilic with small nuclei.
S. japonicum	— ..	0·5	5 acidophilic with large nuclei.
S. ?	(*C. indicae*) ..	0·39	5 acidophilic.
S. bovis	(*C. octadena* ?)	0·43	2 acidophilic. 2 basophilic ? pharynx.
S. ?	(*C. oculata*) ..	0·35	3 acidophilic with small nuclei.
S. ?	(*C. secobii*) ..	0·55	4 all neutrophilic.
S. ?	(*C. gladii*) ..	0·92	3 with small nuclei.

		Testes in adult.	Ova in utero.
S. haematobium	(*C. crispa*) ..	About 4	Numerous spine-pointed.
S. mansoni	(*C. spinosa* ?)	About 8	Usually one lateral-spined.
S. japonicum	— ..	About 7	Numerous ova, practically aspinose.
S. bovis	(*C. octadena*)	—	Numerous spine-pointed.

The author is hardly correct in stating that " at one time it was assumed that the [Bilharzia] worms could be determined in accordance with the species of snail in which the cercariae were found."

R. T. L.

UGI (Sekitaro). **[Experiments on *Schistosomum japonicum*, together with the Results of the Examination of the Feces of the School Children and the Disturbances of the Physical Constitution of the Japanese, with Special Regard to the Intestinal Parasites.]**—*Gun-i-dan Zasshi* (*Jl. Jap. Army Med. Assoc.*). 1922. Dec. No. 118. [Summarized in *Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. p. 89.]

Those most heavily infested with *S. japonicum* are the young men between school ages and 20 years. The infective cercariae cannot infect the skin from a solution of 2 per cent. of human excrement. The rice-fields, which are heavily manured with human excrement contain no molluscan hosts, although the ditches around are profusely inhabited by them. This fact has been utilized as a means of segregating and eliminating the snails. Antimony trioxide in experimental animals has a remarkable efficacy on the ova and adult worms, although its use cannot be immediately adapted to human cases.

R. T. L.

MELENEY (Henry Edmund) & FAUST (Ernest Carroll). **The Route of Migration of *Schistosoma japonicum* in the Body of its Final Host.** —*Proc. Soc. Experim. Biol. & Med.* 1923. Vol. 20. No. 7. pp. 397–398. [3 refs.]

The authors, using a different technique, confirm the conclusions of MIYAGAWA and TAKEMOTO (1921) that the cercariae migrate through the pulmonary veins to the aorta and mesenteric arteries into the capillaries of the stomach and intestine, whence they reach the portal veins [this *Bulletin.* Vol. 19. p. 202].

R. T. L.

ISOBE (M.). **Biological Observations on the Cercaria of the Japanese Blood Fluke.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1923. Mar. No. 227. [In Japanese. English summary, pp. 1–2.]

The temperature of the water controls the escape of the cercariae of *S. japonicum* from its molluscan host. At 15° C. none were seen to escape. At 18–19° C. four hours are necessary, whereas cercariae escape within two hours at 24° C. The character of the water—filtered or ditch water—has little influence. Lightness and darkness are similarly indifferent agents. The cercariae survive one or two days at 23–25° C. They cannot swim against a current, and whilst swimming keep the body always slanting at an angle of 30° with the horizontal.

R. T. L.

CHRISTOPHERSON (J. B.). **The Treatment of Bilharziasis with Antimony.** —*Jl. Trop. Med. & Hyg.* 1923. June 15. Vol. 26. No. 12. p. 211.

Attention is drawn to the fact that MACDONAGH published the following remarks: " I should like to mention that I have had great success in treating cases of bilharzia with intravenous injections of antimony," in the 1915 edition of his book, " Biology and Treatment of Venereal Diseases." Although this was the earliest record of the use of antimony in bilharziasis, it could not have been more effectually pigeon-holed; and it is not surprising that the record remained entirely unknown to the workers in tropical medicine until MACDONAGH himself drew attention to it after Christopherson had later but independently worked out [with great scientific acumen] the use and effect of antimony in this disease.

R. T. L.

i. ISOBÉ (M.). [**Some Studies on the Life History of** *Taenia saginata* (?). (**Report I**).]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1922. May. No. 222. [In Japanese, pp. 1–28. With 4 figs. & 1 plate. English summary, pp. 1–2.]

ii. ——. [**On the Resistance of the Egg of** *Taenia saginata* (?).]—*Ibid.* [In Japanese, pp. 29–75. English summary, pp. 2–3.]

i. In artificial gastric juice at 37–38° C. little change occurs in the eggs of *T. saginata*, but when these eggs are afterwards transferred into artificial intestinal juice at the same temperature the shells turn slowly from brownish into black, expand and become rounded, and in about two hours split to liberate the embryo which is still enclosed in its membrane. After liberation the embryos do not show any movement, nor when they are transferred to physiological saline, diluted pig's bile, or other solutions containing either sugar or alkali. If, however, they are transferred to a mixture containing sodium chloride 1 per cent., sodium carbonate 0·5 per cent., in equal parts, with one drop of pig's bile added for every cubic centimetre and kept at 37–38° C., the embryos soon begin to move actively within their membranes and the hooks seem to be used to wear down the membrane at some place or other and so produce a slight cut which permits the embryo to escape.

ii. It is impossible from the appearance of the eggs to tell microscopically whether the enclosed embryo is alive or dead. The author finds that all the eggs treated with hot water were promptly digested in artificial digestive juice, but eggs not treated in any way are never harmed by the digestive fluid. Under certain experimental conditions the embryos can be released from the egg-shell and can be made to move (see above). Using this as a test, the eggs of *T. saginata* were submitted to various injurious conditions, *e.g.*, to disinfectants, putrefaction, heat, cold, dryness, etc. These experiments showed that the eradication of the parasite by destruction of the eggs is practically impossible.

R. T. L.

BANERJEA (Sauranganath). **A Case of Hydatid Cyst of the Liver.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 263–264

The case of hydatid recorded is that of a Hindu Brahmin, a student of Ravenshaw College, Cuttack, 20 years old, who had never left India and whose geographical range had been limited to Cuttack and Dhenkanal. The signs and symptoms were strongly suggestive of the presence of abcess of the liver.

R. T. L.

TOMB (John W.). **A Treatment for Tapeworm.** [Correspondence.]—*Lancet.* 1923. June 2. p. 1131.

In a very intractable case of tapeworm infection where a fourth treatment with male fern had, as on previous occasions, removed the whole of the worm except the head, the author administered 15 gr. of betanaphthol in tabloid form each morning for ten consecutive occasions on an empty stomach with a cup of tea. No food was allowed until lunch time. This treatment has been tested since by others and has proved uniformly successful.

R. T. L.

GALLI-VALERIO (B.). **Recherches helminthologiques. 1. Infection expérimentale des Cyclops du lac des quatre cantons avec les embryons du *Dibothriocephalus latus*. 2. Les migrations des ascarides dans l'organisme.**—*Schweiz. Med. Woch.* 1923. Mar. 22. No. 12. pp. 314–316.

1. There are certain lakes in Switzerland in which occur *Cyclops strenuus* and *Diaptomus gracilis*, the first intermediaries, and pike and Lota, the second intermediaries, of *Dibothriocephalus latus*, but in which, nevertheless, Dibothriocephalus infection is not endemic. Successful attempts were made to infect experimentally the susceptible crustaceans from one of these lakes, viz., Lake of Lucerne. The author concludes from his laboratory experiments that the lakes at present free from infection are liable to become infected at any time. Attempts to implicate other invertebrates as the primary intermediary were unsuccessful. It is noted that Ephemerid larvae consume the Bothriocephalus eggs with avidity.

2. The author has repeated upon rats and white mice the infection experiments of STEWART, RANSOM and YOSHIDA, using *Ascaris canis* and *A. lumbricoides*. He has never found the larvae in the peritoneum and confirms the view that migration of the larvae to the lungs is by way of the blood-vessels.

R. T. L.

NOC (F.). **Chimiothérapie des filariose. Action de l'amino-arsénophénol (132) sur** *Microfilaria bancrofti*.—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 126–132. With 2 text figs. [16 refs.]

In three cases of infection with *Filaria bancrofti* the author has found that intramuscular injections of amino-arseno-phenol (preparation No. 132 of Dr. POMARET) killed the embryos in the blood. After the injections the embryos disappeared, but an occasional dead and granular embryo could be found in the night blood. The nocturnal periodicity characteristic of the living forms was found to occur with the dead embryos, thus showing that the rhythm is due to some physiological factor. The toxic action of the drug does not continue for more than a month, and must, therefore, affect solely the embryos in the blood and not the adults. The dose used was 0·12 cgm., and in one case dead embryos were observed after a single injection.

R. T. L.

MACFIE (J. W. S.) & CORSON (J. F.). **A New Species of Filarial Larva found in the Skin of Natives in the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 465–471. With 2 text figs. [3 refs.]

In the skin of 22 out of 50 healthy adults between the ages of 25 and 45 years the authors found filarial larvae belonging to a new species, named by them *Agamofilaria streptocerca*. The larva can be distinguished at a glance from that of *Onchocerca volvulus* by its slender body, crook-shaped posterior end and blunt tail. It resembles closely the embryo of *Filaria perstans*, but this latter is shorter, relatively stouter, and the nerve ring, cell G, and the anal pore are situated more anteriorly. Sections of the skin showed the larvae lying in the tissue spaces of the cutis vera or corium, usually close to the rete mucosum, and in all cases there was a slight degree of cellular infiltration. The larva averages in length 215·5 μ ranging from 180–240 μ. In breadth it has a greatest diameter of about 3 μ. The clear area at the anterior end is about 4 μ long. The column of nuclei commences with a single row of ten or twelve nuclei, the first four being usually oval and the others somewhat quadrate. The tail is curved sharply into a crook and the column of nuclei at its extremity is a single row of rounded or oval nuclei. The posterior clear area is at the most about 1 μ long. The larvae do not occur in the blood.

R. T. L.

MACFIE (J. W. S.) & CORSON (J. F.). **Observations on** ***Onchocerca volvulus***.—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 459–464. [4 refs.]

In small pieces of skin, somewhat larger than those used in skin-grafting by Reverdin's method, the authors have invariably found the larvae of *O. volvulus* in those affected with volvuloses. The larvae have been discovered in many cases in which no tumour could be palpated. An examination of 50 healthy men taken at random at Accra showed *O. volvulus* larvae in the skin of 17, *i.e.*, 34 per cent. In three natives examined post-mortem, larvae were found in the skin of widely separated areas, but none occurred in any of the mucous membranes or organs. No adult Onchocerca could be found in any part of the body. Feeding experiments with *Glossina palpalis* and

G. longipalpis and *Pediculus humanus corporis* were negative. As the larvae are particularly numerous in the skin at the base of the trunk it is suggested that *Phthirius pubis* might be regarded as a likely host.

R. T. L.

RICHARDS (W. G.). **Note on** *Dracunculus medinensis* **(Guinea-Worm).**—*Parasitology.* 1922. Dec. Vol. 14. No. 3 & 4. pp. 307–308

A number of men from an Imperial Service Regiment in the north joined the 26th Madras Light Cavalry at Bangalore in 1903. Some months later several of the men were admitted to hospital with guineaworm. An Indian Hospital Assistant advised that the men be fed with raw Indian sugar while starving and provided with only sufficient water to keep them on a sugar diet. Some determined men partook of a pound or more of sugar a day. This treatment was continued for a second day. In such cases the worm was usually out by the third day, it being easy to wind out the worm unruptured in all cases wherein the sugar diet was rigidly maintained. Sugar, taken as described, makes the patient almost unbearably thirsty and would appear to have caused a condition inimical to the guineaworm.

R. T. L.

i. OHBA (T.). [**On the Resistance of the Egg of the** *Ascaris lumbricoides.*]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1923. Mar. No. 227. [In Japanese. English summary, pp. 2–3.]

ii. OHBA (Tatsunojo). [**On the Growth of the Eggs of** *Ascaris lumbricoides.*]—*Ibid.* May. No. 228. [In Japanese. English summary, pp. 1–2.]

iii. ——. [**On the Hatching Conditions and the Infectious Ability of the Eggs of** *Ascaris lumbricoides.*]—*Ibid.* No. 228. [In Japanese. English summary, pp. 3–4.]

i. The resistance of the embryonated egg of *A. lumbricoides* has been studied from the prophylactic point of view.

" In urine, or in the mixture of faeces and urine, the development of the egg is suspended, but it keeps alive; and if the environment is changed, division sets in.

" In perfect dryness the egg starts on a relatively quick development, but will die anyhow, either during growth or after the larva is completely formed.

" The egg containing an embryo will not be injured in such solutions as 20 per cent. salt water, 5 per cent. " Disinfectol," 0·1 per cent. corrosive sublimate, saturated lime water, 10 per cent. acetic acid, or 1 per cent. hydrochloric acid.

" Although the embryo in the shell will not be killed within 24 hours in Japanese soy, sake, 70 per cent. alcohol, 1 per cent. Lysol, 3 per cent. carbolic acid, or human urine, it will die sooner or later if kept in these liquids for any length of time.

" The embryo is very weak against heat and will die in 10 seconds at a temperature of 70° C., and 5 minutes at 60° C."

ii. The albuminous membrane covering the eggshell of *Ascaris lumbricoides* enhances the power of resistance of the egg and facilitates cohesion to foreign bodies, but it does not protect the embryo. In Formosa the best season of the year for development of the eggs is from the last ten days of May to the first ten days of September, when the embryo develops within ten days. The optimum temperature is about 30° C. Development occurs equally well in light or darkness and exposure to direct sunlight does not destroy the embryos when the eggs are collected from faeces or from water, although development is retarded or the embryos are killed when the eggs are cultivated from the adult worms.

Lack of atmospheric oxygen suspends development which, however, is resumed on exposure to air. Cultivation in 2 per cent. formalin prevents putrefaction and stimulates the egg-cells, which, as a rule, develop more rapidly than in ordinary water; 10 per cent. or more of formalin has a lethal effect on the grown embryos.

iii. The eggs of *Ascaris lumbricoides* develop the greatest ability to infect experimental animals in from eight to ten days after the formation of the embryo, and those cultured in ordinary water are more successful than those in 2 per cent. formalin. The eggs may hatch spontaneously in the culture and the larvae live therein. Incubated for five or six hours at 38° C. in 0·2 per cent. HCl, 0·2 per cent. Na_2CO_3, artificial gastric juice or artificial intestinal juice the eggs do not hatch, but if left in these solutions for much longer periods hatching occurs. The rate of hatching is slow and indefinite when the direct mechanical action of the movement of the bowel is eliminated.

R. T. L.

MONSERRAT (C.) & AFRICA (C.). **Certain Developmental Stages of *Ascaris lumbricoides* Ova in the Liver Tissue.**—*Philippine Jl. Sci.* 1923. Apr. Vol. 22. No. 4. pp. 459–465. With 1 plate. [5 refs.]

In histological sections of the liver of a child, aged 3, who died of tubercular meningitis, the authors discovered *Ascaris lumbricoides* ova at four- and eight-celled stages of development embedded in tissue showing advanced inflammatory reaction. No adults were found in the stomach, intestine or bile ducts at the post-mortem.

R. T. L.

LEBEDEV (Dmitry). **Zur Frage ueber die morphologischen Variationen der Askarideneier.** [The Morphological Variations of Ascaris Ova.] —*Jahrbuch. f. Kinderheilk.* 1923. Mar. Vol. 101. Pt. 3–4. pp. 221–224.

The author describes briefly the varieties of Ascaris eggs which may be found in faeces—the spherical or large forms, the appearance of the inner shell, hyaline, faintly granular or striated, the presence or absence of the outer covering, and the character of the contents, granular in the spherical, fatty in the long forms—and questions whether the latter are merely unfertilized ova and also the significance of the other varieties, since all of them may be met with in the stool from a single patient. These questions, however, he makes no attempt to answer.

R. T. L.

LANE (Clayton). **The Mass Diagnosis of Ankylostome Infestation. (Part I.)**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Nov. 16 & Dec. 21. Vol. 16. Nos. 5 & 6. pp. 274–313. With 1 plate & 6 figs. [29 refs.]

Mass diagnosis by microscopical recognition of ova in the stool has fallen into disrepute. The author believing that this is unjustified and indeed lamentable has set himself to clarify the principles which underlie the techniques employed and to elucidate the details in individual methods upon which their success depends. For accurate comparisons it is essential that there should be complete disintegration of the stool sample, that an even distribution of ova should be ensured and the ovum content per cc. estimated as by Lane's Standardizing Count. For the concentration of ova various techniques use the following agencies: *straining, centrifuging, adhesiveness, surface tension, floatation* in solutions of higher specific gravity, and *solution* of fats by ether and of proteids by HCl. For accuracy of examination of concentrated ova the elimination of *camouflage* is most important, for it is a fruitful source of error as a result of the covering of ova.

In comparing concentrative technique it is noted that every technique has its limit of effective concentration. There is an immediate loss of efficiency if an attempt is made to exceed the degree of concentration by an increase in the amount of stool or a reduction of the area upon which concentration is effected. Comparisions of the time-saving efficiency of various techniques are only of value when based upon the time required to reach a negative diagnosis. Further, a separation of the area upon which the eggs are collected and the area on which they are examined detracts from accuracy and lengthens the time involved. The author discusses the concentrative techniques of HOWARD, his own levitation method, this method after double centrifuging, and after double centrifuging with inversion. The advantages of levitation are that it concentrates upon 2 sq. in. of slide the ova from 0·5 cc. of stool in vegetarians, but in non-vegetarians the limit of effective concentration is exceeded and the additional steps required render the technique complicated and time-occupying; moreover, the high meniscus readily spills, there is much cleaning to be done to avoid contamination with ova from previous cases, and the straining is, too often, slow and difficult. The method has now been abandoned by the author in favour of a method of Direct Centrifugal Floatation, for which he has devised a special apparatus to be used in the centrifuge buckets, for an account of which the reader must be referred to the original paper wherein the apparatus is clearly illustrated and its use described in detail. The result of a series of standardizing counts shows that the proportion of ova lost by floatation techniques and in particular by direct centrifugal floatation is small, and the conclusion is reached that the microscope can detect ova in every case in which they are present in the stool. Moreover, it would appear that the proper examination of 1 cc. of faeces suffices to detect ankylostome ova in all cases even if there be only a single female normally ovipositing in the intestine. The author maintains from his experiences that the direct centrifugal floatation method now advocated gives a greater and more reliable concentration than does any other known method. The collecting and examination areas on the slide are identical, so avoiding risk of loss of ova and of time. The apparatus devised is simple and reasonably fool-proof. The examination area is about half a square inch and the film scrutiny is now carried through in two minutes, on the average, by the author. [The paper contains also a detailed study and criticism of various other floatation techniques, and it has a theoretical interest, possibly as great as its practical value to those engaged in the active control of the disease in the field.]

R. T. L.

ACKERT (James E.), PAYNE (Florence King), STOLL (Norman R.) & AUGUSTINE (Donald L.). **Investigations on the Control of Hookworm Disease.**—*Amer. Jl. Hyg.* Baltimore. 1923. Jan. Vol. 3. No. 1. pp. 1–25. With 2 plates & 2 figs. [11 refs.]; pp. 26–34. [8 refs.]; pp. 46–58. [6 refs.]; pp. 59–70. [8 refs.]; Mar. Vol. 3. No. 2. pp. 127–136. With 2 charts. [5 refs.]; pp. 137–155. With 1 fig. [6 refs.]; pp. 156–179. With 4 figs. [15 refs.]

xii. **Studies on the Occurrence, Distribution and Morphology of** *Necator suillus*, **including Descriptions of the Other Species of** *Necator*. [ACKERT & PAYNE.]

In Trinidad 89·9 per cent. of the pigs are infested with a species of *Necator* similar to but, in the opinion of the authors, not identical with *Necator americanus*. This Necator they have named *N. suillus*, and in this communication they contrast it with other species of the genus *Necator*. The Trinidad pigs harbour about 76 worms each on an average. The infestation occurs practically throughout the island and in the heart of the most productive agricultural area.

Seven 26-day old pigs were found to be infested with *N. suillus* and are believed to have been infected prenatally. Several negative attempts to infect young pigs with larvae of *N. americanus* from man indicate that this parasite cannot mature in the pig although typical " ground-itch " occurs at the site of skin infection. Successful infection with *N. suillus* followed experimental infection through the mouth in two young pigs.

[These conclusions must be read in conjunction with earlier papers on the rôle of the pig in spreading human hookworm.]

xiii. **Observations on Conditions under which Hookworm Eggs and Larvae develop.** [ACKERT.]

With the aid of earthen flower-pots and soil previously heated, observations were made on the conditions under which hookworm eggs and larvae develop during the rainy season in Trinidad. Soil pollution, undisturbed, disappears in from 2 to 3 days by the action of rain and insects. The larvae of Drosophila and of other flies inhibit the production of infective larvae in human waste. Soil pollution in partly-shaded environments generally results in large numbers of infective larvae in from 5 days to 3 weeks. When soil pollution is covered with ½ inch to 2 inches of clay loam hookworm eggs hatch and the larvae reach the infective stage in considerable numbers. Hookworm eggs in soil pollution buried under 4 or 5½ inches of clay loam resulted in infective larvae which migrated to the upper part of the culture. The eggs remained viable for 58 days. Covering soil pollution with wood or charcoal ashes proved an ineffective control measure, as large numbers of infective larvae developed in stools wholly surrounded by ashes and the larvae lived deep in the cultures for more than three weeks.

xiv. **Field Experiments on Vertical Migration of Hookworm Larvae. (Preliminary Report.)** [PAYNE.]

A series of field experiments were made to test the ability of buried larvae of *N. americanus* to migrate from various depths to the surface. In faeces buried at depths up to 36 inches in sandy loam soil in Porto Rico larvae developed in large numbers and migrated to the surface. The migration occurred equally whether the larvae were buried after reaching maturity or faeces were buried containing ova. The number of larvae which succeeded in reaching the surface decreased with the depth of burial. In clay, migration did not occur from a depth of 6 inches, but in red clay containing some sand migration occurred from a depth of 10 inches, but not to the same extent as in sandy loam. Observations upon a latrine pit showed that very few larvae could be recovered above the level of inoculation.

The results upon which these general conclusions are based are tabulated and detailed in the text.

xv. **An Effective Method of Counting the Hookworm Eggs in Feces.** [STOLL.]

The following simple procedure has been devised by the author while working in Porto Rico :—

" 1. The feces in their container, as received at the laboratory (chamber or one ounce tin boxes), were balanced on the scales together with spatula (for the small samples toothpicks) and 3 grams weighed, by difference, into a large sized test tube or centrifuge tube graduated at 45 cc.

" 2. Sodium hydroxide in decinormal solution was poured in to the 45 cc. mark.

" 3. Ten small (3 mm.) glass beads were added, the tube was rubber-stoppered and the mixture vigorously shaken to secure a homogeneous suspension. This took a minute's time. When very compact feces were slow in comminuting, the tube was given a preliminary shaking and temporarily set aside. Reshaking then quickly produced an even suspension.

" 4. With the material well mixed the tube was placed upright in a convenient holder (sputum jar), and immediately sampled with a pipette graduated at 0·15 cc.

" 5. All of the 0·15 cc. sample was then transferred to the centre of a large (2 × 3) slide, and a 22 × 40 mm. No. 2 coverslip placed over it.

" 6. With a mechanical stage and a low power of the microscope all of the eggs in the slide preparation were counted.

" 7. The number of eggs found, multiplied by 100, represented the number of eggs per gram of feces used."

Evidence is brought forward to show that the egg count thus secured is a true index of the number of eggs present. The method applies with equal accuracy and readiness to the eggs of Ascaris, Trichuris and Schistosoma.

xvi. **Variation in Length of Life of Hookworm Larvae from the Stools of Different Individuals.** [AUGUSTINE.]

A series of experiments is tabulated which shows strikingly that the hookworm larvae obtained from cultures of the faeces of a number of individuals show differences both in the rate of dying out and in the final limits of their life. No adequate explanation of this can be advanced, nor could a definite correlation be discovered between the age, food-habits or occupation of the various individuals and the length of life of the larvae coming from them. The length of life of the larvae from a single female might be an inherited character. The character of the diet of the host may directly affect the length of life of the larvae. The excrement of persons ill or physically weak may contain certain excretions in such amounts as to alter the normal length of life of the larvae developing in them.

xvii. **A Quantitative Study defining a Point of Breakdown of Hookworm Eggs cultured in Feces, and its Association with Intense Acidity.** [STOLL.]

It is well known that the crop of larvae from cultures of hookworm eggs in faeces varies considerably and that the numbers are uniformly small in cultures made from the faeces from individuals subsisting upon a predominantly vegetarian diet. The author has studied the factors involved in producing this variability and has found that there is a wholesale destruction of hookworm embryos at an early stage in cultures of unmodified faeces. The lethal factor at work apparently prevented the emergence of the embryo from the egg shells. The author puts forth detailed evidence that this fact is, or is associated with, intense acidity, which is mitigated by the inter-mixing of charcoal, sand and humus soil.

xviii. **On the Relation between the Number of Eggs found in Human Feces and the Number of Hookworms in the Host.** [STOLL.]

From an intensive study of ten cases of hookworm the total number of hookworm eggs in the faeces has been computed for from one to five days and compared with worm counts on the patients after treatment. The cases ranged in egg output from 187,000 to 5,059,420 per day. The worm count ranged from 37 to 1,163 *Necator americanus*; of the total 4,704 worms expelled 51 per cent. were females. The average daily egg output per female worm, based on all cases, was approximately 9,000. The ratio of the count per gram of excrement varied from 44 eggs per gram per female worm on formed faeces, to 25 on mushy stools and 12 on diarrhoeic stools. The consistency of the data obtained was such as to recommend the use of a dilution-egg-counting method to determine the intensity of infections of hookworm patients. The author describes his method in detail.

R. T. L.

SMILLIE (Wilson G.). **Studies on Hookworm Infection in Brazil, 1918-1920. Second Paper.**—*Monographs of the Rockefeller Institute for Medical Research.* 1922. May 12. No. 17. 73 pp. With 15 charts in text. [6 refs.]

At the Institute of Hygiene of São Paulo, the author has had special facilities for the study of certain problems regarding the technique of diagnosis and method of treatment of hookworm disease. The conclusions reached are somewhat at variance with popular conceptions though in accord with theoretical knowledge of the life-history of the parasite. The method of study was that followed by the Malaya Board in Java: In a typical community all the inhabitants are registered, their stools examined and their haemoglobin tested. To a group of about 30 persons of different ages, sex, family and occupation, etc., sufficient chenopodium is given to remove 98 to 99 per cent. of the hookworms they harbour. The worms passed are counted and classified and the following data regarding each patient are carefully noted:—name, race, sex, age, occupation, length of residence on the plantation, haemoglobin, spleen index by palpation, previous worm treatment; also the results of the preliminary microscopical examination of stools, mode of treatment, symptoms during treatment, number of evacuations, number of worms, which are identified. On such complete detail the following conclusions have been reached :—

Distribution of hookworm disease in relation to age and sex.—The disease is primarily one of young adults, chiefly of young men, whom it attacks most severely during the productive period of life. The most effective work in combating hookworm disease is that directed towards these individuals. Old people of over 50 years of age should never concern the sanitarian, for they are seldom heavily infested, and are slowly but surely losing their worms, and their economic value to the community and to themselves is almost over. Children under 10 years of age are only lightly infested. Women are infested to a lesser degree than men, and their infection rate diminishes after the marriageable age, for they then cease to work regularly in the fields.

Hookworm disease in children is nevertheless of great importance. One half of the children in age group 5–9 years had less than 11 worms each and three-quarters had less than 51 each. Charts show that infection gradually and progressively increases in the child with age and is much more widely distributed among children in the older age groups. It appears that when the children reach the age of about 9 some factor enters their lives which greatly increases the degree and distribution of the disease—this is shown to be the period at which the child normally begins work in the fields. The slow increase of infection in children who do not work in the fields is incidental and does them little harm. Those who work in the fields are invariably heavily infected and have the disease. The author is of opinion that in Brazil it is undesirable to treat children under 5 years at all. Between 5 and 8 years a small dose may be given to remove Ascaris and other intestinal worms, but not a full dose for hookworm, for children of 8 years or less are particularly susceptible, and almost all the fatalities have occurred in children below the age of 9.

Hookworm disease is due to direct contact with humid earth.—It is clearly shown by charts and statistics that under Brazilian conditions the disease is occupational in those who work in polluted soil and that contamination of food and drinking water is negligible. The author concludes that we must qualify the generalization that hookworm abounds in all people in tropical and sub-tropical climes, for it is largely limited to soil workers.

Influence of the use of shoes on infection.—Shoes in rural Brazil are a serious economic problem, for a very poorly made pair costs two or three weeks' wages. In the wet season these gather up the sticky mud until each foot weighs from 5 to 6 pounds, and prove, therefore, a great inconvenience. Adults rarely and children never use them in field work, yet the field labourers who work barefooted side by side with men who wore shoes had an average of ten times as many worms as their shod companions and the effect was clearly shown in their haemoglobin index.

Hookworm infection is slowly acquired and slowly lost.—Mass infections are not acquired in a week or a month but over a period of years.

The haemoglobin index in relation to the number of hookworms harboured, when estimated with the Dare method, shows wide individual variations and is not a good index of the worms in an individual, but it is one of the best and earliest indices we have of the amount of injury being done in a given case. An average infection of 25 hookworms is not sufficient to reduce the index in the least, even in children of from 5 to 9 years of age. In heavy infections of 700 in children and the aged, the average haemoglobin is more than 20 points below normal.

Young adults are much more resistant; even 700 hookworms cause a decline of only 10 points.

The influence of nutrition on hookworm disease.—In the breaking down of resistance, one of the most important of the many associated causes is poor and insufficient food, and the author is convinced that hookworm oedema is closely related to war or starvation oedema and that it is clinically impossible to distinguish them.

Distribution of hookworm species in Brazil.—Where there has been extensive immigration of field labourers from Southern Europe or Japan into Brazil, there has been a corresponding increase in the number of *A. duodenale.* The prevailing hookworm throughout Brazil is *N. americanus,* and natives living two or three miles from immigrants and not in contact with them are very slightly infected with Ancylostoma.

Value of the routine microscopical examination of stools in field treatment is briefly discussed as a result of the investigation of 131 additional cases. The author believes that with a slight modification of technique (viz., the re-examination of all field workers between 8 and 50 years of age whom the microscope has reported as negative) the microscope will be found to be an accurate and valuable aid in the campaign treatment of hookworm disease, but it cannot be expected to diagnose accurately cases harbouring 10 or fewer hookworms. The presence of 10 or less worms do not cause sufficient injury to warrant the inconvenience and discomfort of two full treatments.

The efficiency of the undivided dose of chenopodium in field treatment has been investigated as a result of a fortunate misdirection, and it is shown that the 1·5 cc. undivided dose of chenopodium without a preliminary purge is a very unsatisfactory method. A tabulated comparison of the effect of the divided and undivided 1·5 cc. dose shows a lowering in the effectiveness of the drug by more than 25 per cent.

R. T. L.

PESSOA (Samuel B.). **Pesquizas sobre a uncinariose no Brasil.** [Researches on Hookworm in Brazil.]—*Ann. Paulist. Med. e Cirurg.* 1922. May–Dec. Year 10. Vol. 13. Nos. 5–12. pp. 132–165. [4 refs.]

Hookworm is very prevalent in Brazil, some districts having a percentage of over 90. The Necator was found to be more than 50 times as frequent as Ancylostoma. The material being so abundant, the following researches were carried out:—

1. The value of a routine examination of the faeces for diagnosis in the first place, and for determining whether a cure has been effected in the second. It is shown that many cases are missed. Thus, 21 persons, 11 adults and 10 children, who had been called negative after microscopical examination for ova, were given a dose of oil of chenopodium; 9 of the 11 adults and 6 of the children passed hookworms as a result.

2. The efficacy of two treatments with oil of chenopodium. In a large majority of cases this was very satisfactory. 1·5 cc. was given in three doses, repeated 10 days later. In a few with heavy infection and marked anaemia a third treatment is recommended.

3. The value of betanaphthol as an anthelmintic. The dosage of this varied according to age—3 gm. in divided doses to children between 5 and 10 years, 6 gm. to adults. The drug was administered in gelatine capsules on three successive days. It was found to be very effectual but not quite so good as oil of chenopodium, and the cost was greater.

4. The best method of giving oil of chenopodium, whether as a single dose or in divided doses, whether preceded or not by a saline purgative the evening before. The results obtained were somewhat peculiar. If a preliminary purge was given a single dose of 2 cc. was found to be more effectual and less toxic than 1·5 cc. in divided doses. If the preliminary purge was omitted the reverse obtained—2 cc. followed by a purge in two hours proved less effectual than 1·5 cc. in two parts at two-hour intervals, similarly followed by an aperient.

H. Harold Scott.

SWEET (W. C.). **The Australian Hookworm Campaign.**—*Health.* Melbourne. 1923. June. Vol. 1. No. 6. pp. 158–161. With 1 map in text. [1 ref.]

On October 1, 1919, a campaign estimated to cost £100,000 in five years, was begun against hookworm in Australia. Field units working under the direction of a central office at Brisbane have now surveyed the continent of Australia and Papua and New Guinea. The results are tabulated thus :—

	Number of Persons examined.	Number of Persons infected with Hookworms.	Percentage infected.
Endemic Areas :—			
Queensland	130,833	14,067	10·7
New South Wales	13,000	765	5·9
Western Australia	810	303	37·4
Northern Territory ..	806	148	18·4
Total	145,449	15,283	10·5
Non-endemic Areas :—			
Queensland	32,116	389	1·2
New South Wales	8,298	5	0·06
Tasmania	2,209	2	0·09
Victoria	2,497	0	0·0
South Australia	3,281	0	0·0
Western Australia	2,036	5	0·2
Northern Territory ..	80	0	0·0
Total	50,517	401	0·8
Special Investigations :—			
Papua	17,905	10,601	59·2
New Guinea	28,234	20,951	74·2
Endemic Coal Mines, Queensland ; Ipswich, Burrum, & Mount Mulligan Fields	1,341	517	38·5
Hospitals for the Insane, Queensland	3,000	499	16·6
Total	50,480	32,568	64·5
Grand Total of Areas completed up to December 31, 1922	**246,446**	**48,252**	**19·6**

On the basis of the above information a scheme for the permanent control of hookworm has been devised by Dr. SAWYER (*Med. Jl. Australia.* 1922. Feb. 11). The heavily infected parts of the coast were to receive yearly intensive attention; the more lightly infected parts a bi-yearly or tri-yearly intensive campaign with a check on the hookworm index by a survey of the school children in other years. Special problems, *e.g.*, those of infected mining areas, were to have special methods devised as need arose. In New Guinea the natives were to be treated *en masse* without previous examination. A table is also given showing the improvement in the hookworm index as compared with that found at the commencement of the campaign.

R. T. L.

STEKHOVEN, Jr. (J. H. Schuurmans). **De Bestrijding der Anchylostomiasis.** [The Combating of Ankylostomiasis.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 392-405.

The author gives a scheme, following well-known lines, for a hookworm campaign in Java. A preliminary investigation showed that *Necator* was far more prevalent than *Ancylostoma; A. ceylanicum* was not met with. In infections with Ancylostoma there is generally an excess of the male worms, in Necator generally females are found in greater numbers, but the author considers it possible that many of the small Necator males are lost in counting.

W. J. Bais.

HUNT (Daniel) & JOHNSON (A. L.). **Hookworm Studies in American Samoa.**—*U.S. Nav. Med. Bull.* 1923. June. Vol. 18. No. 6. pp. 685-688.

In 1908 ROSSITER reported that hookworm prevailed throughout the Samoan Islands. Between 1908 and 1921 the annual sanitary reports show that 1,066 cases were treated for hookworm. From one of these over 3,000 worms were recovered and there were several cases with 200 or more worms. The authors have examined the stools of 1,200 natives from all parts of the islands: 87·6 per cent. harboured intestinal parasites, 59·6 per cent. showed Ascaris, 58·8 per cent. had Trichuris, while hookworm occurred in from 8 to 78 per cent., according to the soil and general sanitary conditions.

Of 1,000 hookworms recovered from 50 cases, 780 were females and 220 males—all of the species *Necator americanus.* Fifty pigs from different localities gave 66 per cent. with hookworm, but the species could not be identified. It never occurred in man, nor did the authors ever find *Necator americanus* in the pig. In a study of 100 cases of hookworm infection treated with thymol 14 per cent. remained positive. A similar number treated with oil of chenopodium gave six persistent infections, while only one out of 100 who received carbon tetrachloride remained positive. In another group whose stools were negative 17 per cent. passed adult hookworms after a single dose of carbon tetrachloride. The worms varied in number from 1 to 17. In the case in which 17 were recovered, 11 were females and 6 males.

Reinfection occurred within six months in 24 per cent. of the group treated with chenopodium oil.

In American Samoa severe symptoms have only been observed in the presence of intercurrent diseases.

R. T. L.

SEKI-ENSEI. **The Anthelmintic Effect of Carbon Tetrachloride ($C\ Cl_4$) in Anchylostomiasis.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1923. May. No. 228. [In Japanese. English summary, pp. 6–7.]

Carbon tetrachloride is not only cheaper, but is also superior to Nematol in its action on hookworm, although chemically impure samples may contain carbon disulphide and give rise to symptoms of poisoning. The author's conclusions are based upon the treatment of over 200 ankylostome patients with 4 millilitres, preceded and followed by a purge of magnesium sulphate.

R. T. L.

EGUCHI (Suyewo). [**Studies on Ankylostoma. On the Invasion and Fate of the Larvae of the Ankylostoma into the Tissue of Heterogenous Animal.**]—*Aichi Igakkai Zasshi* (*Jl. of Aichi Med. Soc.*). 1922. Nov. Vol. 29. No. 6. [Summarized in *Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. p. 79.]

The encysted infective larvae of the human and canine ankylostomes invade the skin of various heterogenous animals, *e.g.*, rabbit, guinea-pig, rat, mouse, domesticated fowl, frog, fish, etc., irrespective of the supposed environmental conditions which might favour the invasion. The invading larvae lie wedged in the subcutaneous tissues or in the lung and die, but no trace of the defensive mechanism could be detected.

R. T. L.

GORDON (R. M.). **A Further Note on the Occurrence of Ancylostomes resembling** *Necator americanus* **amongst Domestic Pigs in Amazonas.**—*Ann. Trop. Med. & Parasit.* 1923. July 12. Vol. 17. No. 2. pp. 289–298. With 2 figs. [4 refs.]

In view of the work of ACKERT and PAYNE on the *Necator* found in pigs in Trinidad, which they consider a new species, *N. suillus* [see above], the author has again studied in detail his material from the Amazon. He concludes that (*a*) length cannot be taken as a distinguishing character. (*b*) The buccal capsule is proportionately greater in the Necator from the pig, whereas ACKERT and PAYNE report the reverse. (*c*) No constant differences can be noted in the dorsal curve of the anterior part of the body. (*d*) There are marked variations in the dorsal tooth and the ventral and lateral lancets of both worms. (*e*) The length of the dorsal rays does not agree with the findings in the Amazonas material. (*f*) There is no proportionate differences in the size of the body space. (*g*) The shape and proportions of the bursae in the two worms appear to vary with the approximation of the two halves of the bursa. (*h*) The union of the lateral and dorso-lateral papillae occurred in both forms, but was not constant in either. (*i*) The length and shape of the spicules is not regarded as a reliable point of distinction. (*j*) In size the ova are almost identical. Attempts to infect pigs in England have resulted in the occurrence of Necator-like ova in the faeces, but no adults could be found at post-mortem. This evidence is not sufficiently definite to refute the negative results obtained by ACKERT and PAYNE.

R. T. L.

DE LA PAZ (D.). **On the Anthelminthic Property of** *Quisqualis indica.*—*Trans. 4th Congress Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. pp. 255–256.

TAVERA has claimed that the seed of *Quisqualis indica*, which grows wild in the Philippines, is a powerful anthelminthic remedy and its efficacy is vouched for by other physicians, although no actual results have been published. Experiments by the author on the ascarids of the dog *in vitro* and *in vivo* did not give any satisfactory confirmatory results.

R. T. L.

JOYEUX (Ch.). **Diagnostic et traitement des vers intestinaux les plus communs.**—*Rev. Prat. Malad. des Pays chauds.* Paris. 1923. Feb. pp. 35–49.

This paper is an extract from an article " Vers intestinaux " in the " Traité de Medecine," Paris, now in the Press. It is a useful summary of our knowledge of the subject, but naturally contains little that is new.

R. T. L.

DIAMANTIS. [**La teoria dell' infezione perineale da** " *Schistosomum haematobium* " **nell' uomo e conseguenze pratiche.**]—*Bull. Soc. Internat. de Méd. du Caire.* 1922. [Summarized in *Ann. Med. Nav. e Colon.* 1923. Jan.–Feb. Year 29. Vol. 1. No. 1–2. pp. 83–84.] [See this *Bulletin*, Vol. 20, p. 624.]

FILIPPINI (Azeglio). **Il ciclo dell' infestione da ascaridi e da ossiuri.**—*Policlinico.* Sez. Prat. 1923. Sept. 24. Vol. 30. No. 39. pp. 1256–1258. [11 refs.]

MALARIA.

SPENCER (H. A.). **Malaria in the Transvaal.**—*Jl. Trop. Med. & Hyg.* 1923. Oct. 1. Vol. 26. No. 19. pp. 297–305. With 1 chart.

Spencer amplifies experiences already described [this *Bulletin*, Vol. 20, p. 291]. An unduly wet season in the Transvaal is a malarially healthy one, anopheline eggs, larvae and pupae being washed away by the rush of water. Apart from an acquired tolerance, of the existence of which he is convinced, he has met a number of persons whom mosquitoes will not bite, and who do not acquire malaria, among them men who, to their annoyance, went right through the trying South-West African Campaign without the respite of even a day in hospital, an annoyance not mitigated, and not controlled, when it was suggested that they should submit to a direct injection of malarial blood to settle the question of their actual immunity. As the season proceeds tertian gives place to subtertian malaria, a condition apparently not looked upon as synonymous with infection by *Plasmodium falciparum*. Symptoms held characteristic of subtertian malaria are: jaundice with vomiting, the vomited matter having a smell considered characteristic of the malarial toxin; hypochondriac pains attributed to stasis at the two colonic flexures; precordial and other pains, photophobia, bronchial catarrh. Quinine in the interests of the child is strongly urged in pregnancy. The dose of quinine advised for an adult man is ten grains three times a day till the fall of temperature, and thereafter twice daily for four days. This quantity is held sufficient to cure tertian malaria, reappearances being looked upon as reinfections [see this *Bulletin*, Vol. 18, p. 335]. Organic arsenic, as soamin or cacodylate of soda, given intramuscularly to avoid rapid elimination, is held deadly to the malarial parasites.

Clayton Lane.

SOROMENHO (L.). **Epidemiology of Malaria and Blackwater Fever in Portuguese East Africa between 1901–1920.**—*Med. Jl. S. Africa.* 1923. Mar. Vol. 18. No. 8. pp. 201–206.

An attempt to estimate the epidemiology of malaria by hospital statistics based on a diagnosis mainly clinical, without knowledge of the country's population, cannot, as Soromenho insists, be accurate, but may be useful. The mosquitoes implicated are *Anopheles costalis*, *A. funestus*, *A. paludis*, *A. pharoensis*, and the species of malaria parasites at Lourenço Marques are *Plasmodium falciparum* and *P. vivax* in the proportion of four or five to one. The statistics of the eight established hospitals indicate a general decline in malarial morbidity during the last twenty years, but that this is not a necessary indication of mortality is shown, as pointed out, by a reported morbidity in whites ten times greater than that of any other race, while the corresponding mortality is less than half. The curve of blackwater fever is, in general, parallel to that of malaria, with a mortality in whites of 25 and in negroes of 83 per cent.

C. C.

WALRAVENS (P.). **Index endémique du paludisme à Elisabethville.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 5–15. With 1 map.

At the end of the rains, March, 1922, bloods of children of African soldiers gave a parasitic index of 50 in thin smears, increased to 75 when thick smears were also examined. Presumably in each case one slide was searched. This double technique was also adopted for 707 children examined in September, 1922, at the end, that is, of the dry season. Of 527 African children then examined the parasitic and splenic indices were both 45, the soldiers' children giving a parasitic index of 61. Of 180 European children, who had received quinine, only 2 showed parasites and 3 palpable spleens. It is interesting to correlate with VELDEE's paper (see below) the fact that although 247 of the African children had palpable spleens and 235 showed parasites by the technique used (although the totals, that is of the parasitic and splenic indices, were almost indentical, and one would seem to be in this locality as valuable an indication of the general malarial incidence as the other), yet there were 111 children who had palpable spleens without detected parasites, and 99 in whom parasites were found but the spleen could not be felt. Combining the splenic and parasitic indices, there was evidence of malaria in 346 out of 527 persons, giving a rate of practically 66 per cent. Using the splenic index qualitatively, the projection of the apex of the spleen one finger's breadth below the costal margin is the unit. The total of finger breadths or units divided by the number of cases examined gave the figure of this qualitative index. It varied in the different camps surrounding Elizabethville from 1·59 to 2·56. Of the 240 children in whom malarial parasites were detected 6 harboured *Plasmodium falciparum*, 233 *P. vivax* and 1 *P. malariae*. The work in prospect contemplates the determination of the actual mosquito acting as definitive host, so that antilarval work may be concentrated upon its breeding-places. It is recommended that all children should take quinine from September to April inclusive, and felt that the discipline enforced in the camps suffices to insure its regular administration.

C. L.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Index de paludisme et essai de prophylaxie quinique dè la Malaria, à Léopoldville.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 37–44. [3 refs.]

Among 421 native children examined in the hot weather by a thin and a thick smear, percentage of infection of 86 was established for children under 2, of 72 from 2–8, of 70·5 from 8–12 and of 50·6 above 12 years of age. The splenic index for the same periods registered 75, 91, 73, 40. The species of parasite did not vary proportionately with age or sex, the quartan parasite infecting 7·9 and the subtertian 92·1 per cent. Combining parasitic and splenic indices 92·2 per cent. of children showed evidence of infection. Tests showed further that those who had, certainly with incomplete regularity, received quinine once a week for a year, had considerably less infection at the end than at the beginning of the period. They had also, it must be added, received anthelmintic treatment. The improvement is in excess of that which the increase in age would have effected.

C. L.

LEGER (Marcel) & NOGUE (M.). **Le paludisme chez les Noirs adultes de l'Ouest-Africain. Etude parasitologique et clinique.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 281–293. [26 refs.]

A consideration of immunity treated parasitologically by Leger and clinically by Nogue. Of 303 adults—healthy, or if in hospital picked without reference to malaria—examined in the malaria season by a single thin smear, as the context indicates, 47·5 per cent. contained parasites in the blood. Of 142 examined in the healthy season the percentage was 7. In each case 80 per cent. of the infection were with *Plasmodium falciparum*, the rest with *P. malariae*. In the unhealthy season the percentage of infection of children under 2 was 64, while in adults over 20 further age brought no further decrease. It is suggested that the relative immunity of adults is due in part to the fact that they sleep covered from scalp to sole and anoint themselves with noisome fats, and partly to a schizolytic power present in the serum at the end of a paroxysm, which power must be assumed to be reinforced by subsequent infections. The outstanding feature of the communication is, however, the persistence of parasites in the peripheral blood, evidence, strictly speaking, of tolerance rather than immunity, a condition which, as Leger notes, MANSON insisted upon as the essential factor in these cases. In Nogue's experience the local adult negroes have fever rarely, and when they do it is of short duration and spontaneous cure, whereas in children the clinical aspect is the accepted one. In them the temperature did not reach 37·5° C. (99·5° F.) unless there were malarial infection. He cites cases suggesting that men acquire a tolerance to strains existing in their own country which is not evident when they are infected elsewhere. Regarding latency CRAIG alone is quoted, but many instances are constantly reported in this *Bulletin*.

C. L.

DELBREIL. **Notes sur le paludisme à Kaolack.** [Senegal.]—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 272–275.

Take a splenic index of 100 in children of 5 years and under, with the usual clinical concomitants, in a spot which is practically an island surrounded by marsh lands; add uncovered wells and masses of trees rich in hollows ideal for larval breeding, and a population which sees little effect from quinine except the induction of blackwater fever, and you have a pretty recipe for the hygienist. Clinical manifestations in adults are uncommon. The type of blackwater fever is mild. A prophylactic dose of not less than 0·4 gm. of quinine for an adult and injection of 0·6 gm. of quinoform for a child of 3 months are advised.

C. L.

PALESTINE. **Proceedings of the Sixth Meeting of the Antimalarial Advisory Commission, 30th November, 1922.** [HERON (G. W.), Director of Health, President.] [MS. received from the Colonial Office.]

The Joint Distribution Committee of American Funds for War Sufferers has financed and placed under the Palestine Department of Health a complete Antimalarial Research Laboratory, while the Rockefeller Foundation has provided an Antimalarial Survey Section.

Research shows that *Chara foetida* and mosquito larvae amiably cohabit, and divides the Anopheles of Palestine into four groups: (*a*) The strictly rural house-haters, *A. hyrcanus*, *A. algeriensis* and probably *A. mauritianus*. (*b*) The rural house-haunters, of great malarial importance, *A. elutus*, *A. sergenti*, *A. superpictus*, *A. multicolor*. (*c*) The urban malaria carrier, *A. bifurcatus*. (*d*) *A. pharoensis*, very rare, possibly absent. Cyprinodon as a larviphage is considered very valuable. A parasitic survey in Beisan recalls irresistibly the humours of Aesop. In each village a confiding victim was induced to surrender a blood film, and became the first of a snowball of apostles who insured a full day's work for the unit. In July the splenic index among 529 persons was 46, the parasitic index among 663 was 1·9; the actuals being *Plasmodium vivax* 8, *P. falciparum* 3, *P. malariae* 2. In October the spleen rate was 46·7, and the parasite rate, in 80 children, 18, the actuals being *P. vivax* 6, *P. falciparum* 9. The control of irrigation and the institution of other surveys are planned.

C. L.

MAPLESTONE (P. A.). **Malaria in Australia.**—*Ann. Trop. Med. & Parasit.* 1923. July 12. Vol. 17. No. 2. pp. 213–229. With 1 map in text. [41 refs.]

A useful survey of the "incomplete and unreliable records" of malaria in Australia. In the northern regions the striking feature is a series of malarial outbreaks of short duration, the beginning of each traceable to a fresh introduction of infection, and the dying out not reasonably explicable, it is held, by scarcity of man or mosquito. The insect implicated has not been traced. Investigations on temperature and humidity on GILL's lines [this *Bulletin*, Vol. 18, p. 328] are urged.

C. L.

RASHINA (M.). **[A Survey of the Activities of the Malaria Stations.]**—*Hygiene & Epidemiology.* Moscow. 1922. No. 2. pp. 74–78. [In Russian.]

JUKOV (N.), MARZINOWSKY (V.) & SUTCHKOVA (O.). **[Malaria in the Shatur Peat Hags and the Campaign against it.]**—47 pp. 1923. Moscow. [In Russian.]

To combat the recent intense spread of malaria [this *Bulletin*, Vol. 20, p. 557] the Moscow Tropical Institute has initiated 32 Malaria Stations. At the Sochi Station on the Black Sea Coast the parasitic index, presumably established by a thin film, was 82·1 in adults and 100 in children, the splenic index varying from 46·4 to 90. Subtertian malaria constituted 31 per cent. of these in August, 1921, and 42·2 per cent. in August, 1922. After measures of drainage, petrolage, and quinine administration, continued for so long as the inadequate allotted funds permitted, the percentage of infection fell in one year from 90 to 20. In certain hill regions the percentage of subtertian malaria rose from 31 to 42·2 in a year. In the Saratov Station 65 per cent. of the population was infected, 80·6 per cent. of these with subtertian malaria. In the Central Russian peat hags the percentage of infection varied from 26·3 to 100, while in Children's Homes in Moscow *P. vivax* infected 35 to 46·3 per cent. In the Central Russian peat hags and swamps (Shatur), abounding in *A. maculipennis*, the malarial incidence of 1918 was 0; for 1919, 84; for 1920, 405; for 1921, 1,130; during the first 5 months of 1922, 1,760. Immigrant labourers, it is held, working from May to July, have introduced malaria here, and now act as distributors of the infection throughout Russia. Two-thirds of the working population here were examined, 26·3 were infected, mostly with benign tertian malaria, and half of these harboured gametocytes.

C. L.

JAARVERSLAG DER MALARIACOMMISSIE VOOR NOORD-HOLLAND OVER 1922. **(Uitgebracht aan den Minister van Arbeid, Handel en Nijverheid.)** [ALDERSHOFF (H.), Chairman. KORTEWEG, Secretary.]—Reprinted from *Verslagen en Mededeelingen Betreffende de Volksgezondheid.* 1923. Mar. 26 pp. With 1 chart. [23 refs.]

The third Report of this Commission [see this *Bulletin,* Vol. 19, pp. 282 and 855] states that during 1922 the first larva of *Anopheles bifurcatus* was found in North Holland on April 13, and the first male, indicating the maturation of the new brood, on May 27. The last male was found on October 10, and the last ripe eggs in September, two months earlier than in the previous year. Sprinkled upon water in a thin layer paraffin killed pupae in two hours, while some larvae were still alive after 48. Nevertheless, even if these were removed to clean water they all died, paraffin having, as examination showed, reached their finest air tubes. For the imagines the use of 3 per cent. lysol continued to give satisfaction. Infection among them was evident from September to March, with a maximum incidence of about six per cent. in November.

Regarding human infection, of 6,215 slides examined 2,762 contained plasmodia. The percentage of malarial cases in three selected medical practices was 6·4, 8·8 and 4, as against 8, 8·3 and 10 in 1921 and 16, (?) and 9 in 1920. Euphysol-quinine and ethyl-hydrocupreine were tried but did not prove to be advances upon quinine itself. Screening has proved a practical measure. The output of published work by the Commission has been considerable.

C. L.

DE BUEN (Sadí). **La campaña profiláctica contra el paludismo en la provincia de Cáceres (1922). Informe general.**—*Arch. Inst. Nac. Hygiene de Alfonso XIII.* 1923. Aug. Vol. 2. No. 2. pp. 97–128. With 6 charts. [3 refs.]

In the Spanish Province of Cáceres, adjoining Portugal, on the Tagus, antimalarial work has been carried on for another year, the number of towns involved being 99 as against 59 in the year previous, the sick 3,595 as against 1,890, the smears examined 4,265 as against 2,050, and the number found infected 2,083 as against 847. Taking Vera as an example, of 2,153 smears 888 were positive, comprising 453 tertian, 204 quartan, 153 subtertian, 70 unclassed, and 8 mixed. Again, spleen and parasite rates were simultaneously investigated in 1,668 persons. Of these 1,261 had no palpable spleen yet parasites were detected in 514 of them ; in 273 it projected one finger's breadth, with detected infection in 151 ; in 117 it reached the umbilicus, with detected infection in 65 ; where it was still larger the figures were respectively 17 and 2. Over 41 kgm. of quinine in various forms has been distributed. *Gambusia affinis* has been acclimatized, and all demands for its distribution met.

C. L.

*** From summaries by Mr. C. A. HOARE.**

MAXCY (Kenneth F.). **The Distribution of Malaria in the United States as indicated by Mortality Reports.**—*Public Health Rep.* 1923. May 25. Vol. 38. No. 21. pp. 1125–1138. With 7 figs.

The distribution and importance of malaria as revealed by mortality statistics is the basis of this study. Eliminating counties in which this incidence is low, on the grounds that a few imported cases may vitiate all conclusions, malaria in the United States is mainly confined to the coastal plain, bounded on the east by the Piedmont and mountain regions and on the west by the arid plains of Oklahoma and Texas, but extends far inland along the broad, flat Mississippi Valley. It is six times commoner in rural than in urban areas, and its distribution is focal. While the northern border of the malaria belt is steadily retreating southwards, its intensity in the three Valley States, Mississippi, Louisiana and Arkansas, increased definitely in 1921, the last year for which figures are available.

C. L.

MAXCY (K. F.) & ZIEGLER (M. V.). **The Malaria Problem of South-east Missouri.**—*Public Health Rep.* 1923. Feb. 9. Vol. 38. No. 6. pp. 233–250. With 1 map in text. [3 refs.]

The malaria incidence here considered is based upon a "history index" collected by Ziegler during a house to house visitation in an area consisting of three parts : swampy and but partly cleared forest ; a new settlement ; an old and permanent one situated on a ridge. The rates of attack per cent. per annum were for the three respective areas 15·1, 6·7, 2·8. For reasons given part of this incidence is ascribable to the local topography with its different facility for anopheline breeding ; part to the differing mosquito-proofness of the houses, no screening of doors or windows sufficing to make a log hut mosquito-tight ; partly to poverty with overcrowding, conditions under which a mosquito can, with minimum trouble, infect several members of a family. The shifting tenancy of the farmers does not make for effective screening, since they will neither fit it for themselves nor take proper care of it if the landlord do it for them. School and home education in malaria, and adequate medical attendance, are urged as essential preliminaries to its control.

C. L.

BRIGGS (Le Roy H.). **Malaria in San Francisco.**—*Jl. Amer. Med. Assoc.* 1923. Aug. 11. Vol. 81. No. 6. pp. 450–452. With 2 figs.

The means adopted for the differentiation of asexual forms of the tertian and subtertian parasites is that the latter being non-amoeboid lodges in the capillaries after attaining a quarter of its growth and so disappears from the peripheral blood, while the amoeboid tertian parasites squeeze through and so remain circulating ; diagnositic criteria differing from those generally held. This point must be remembered in estimating the value of two local spot maps illustrating the places where 143 persons acquired their respective types of malaria.

C. L.

BASSETT-SMITH (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part I. (i) Malaria and Blackwater Fever.**—*Jl. Roy. Nav. Med. Serv.* 1923. Apr. Vol. 9. No. 2. pp. 126-136. With 1 chart in text.

Adequate abstraction of a comparatively short and condensed paper dealing with the naval history of malaria in the war is impossible. Some few points are indicated. Returns from Simonstown show that by the time men reached the base the parasitic picture of those coming from Equatorial West Africa showed *Plasmodium falciparum* in every case, with or without *P. malariae*; from South-West Africa *P. vivax* and *P. falciparum* about equally divided; from East Africa and Tanganyika a preponderance of *P. vivax*, practically every man being infected. Of cases which reached the Dreadnought Hospital, the infections, or at least the residual infections, in cases from the Persian Gulf were preponderatingly with *P. falciparum*; from the Mediterranean with any parasite varying according to the season; from North Russia and the Danube with *P. vivax*, which parasite seemed to be the most frequent cause of relapse at home and produced 32 autochthonous infections among naval forces in England. It was, however, the case that Naval Air Stations in the Mediterranean were the main sources of naval malaria. Three anomalous conditions occurred: "Pyrexia undoubtedly due to malaria" without parasites in the peripheral blood; parasites in the peripheral blood without symptoms; incidence of parasitic and clinical relapse while the individual was under full quinine and arsenic treatment. In naval experience the prophylactic use of quinine has been of undoubted value, even if only for the suppression or latency it induces during active service. In Malta the usual routine treatment, and that judged to be the most effective, was 10–12 injections of bihydrochloride of quinine, each of 15 gr.; followed by 15 gr. of the hydrochloride daily by mouth for 21 days. At the Cape subcutaneous injections resulted in a crop of the usual catastrophies.

C. L.

GIOSEFFI (Mauro). **Se e quando possa sorgere un sanatorio in regione malarica.**—*Riforma Med.* 1923. May 21. Vol. 39. No. 21. pp. 489–490.

High altitudes are unsuitable for certain tubercular cases; sea air benefits them. But in Italy the sea coast is malarious. Could a spot so eminently suitable, apart from malaria, for the erection of a sanitorium, as is the Island of Brioni on the eastern margin of the Adriatic, be so administered that tubercular persons there collected would not run the risk, grave for them, of the acquisition of malaria? The necessary preliminaries are sketched and include examination of all inhabitants of the island and expulsion of such as remain infected; antilarval measures of all kinds; thorough screening. It is pointed out that malaria-free Vienna children enter the Ospizio Marino of San Pelagio and there acquire infection, that congregation in dormitories conduces to the spread of infection, and that, to insure the three-kilometre radius from the sanitorium deemed necessary, antimalarial measures as strict as those mentioned should be applied to the facing Istrian coast. These considerations demand also the strict supervision of all inmates and the exclusion or expulsion of all found to be infected. The scheme is clearly a costly one, and its success would seem to depend on the assumption that all malaria can be detected in one examination by the diagnostic measures at present in vogue.

C. L.

WOENSDREGT (M.) & VAN DAM (C.). **Bloed- en parasietenbeeld bij den aanval van malaria tertiana.** [Result of Blood and Parasite-Counts during an Attack of Simple Tertian.]—*Nederl. Tijdschr. v. Geneesk.* 1923. May 12. 67th Year. 1st Half. No. 19. pp. 2002–2010. With 2 curves.

Blood- and parasite-counts were undertaken in four cases of benign tertian (two simple infections, and two double) acquired in Holland. Preparations were made every hour or half-hour beginning some hours before the expected attack, and continued until several hours afterwards. The leucocyte counts were made in the wet chambers of Bücker and Türck; the differential count was based on 300–500 leucocytes, with the use of SCHILLING's scheme. Beside this was noted the relative number of each type (young rings, older rings, full-grown with 1, 2–4, 5–10, 11–18 nuclei, complete segmentation, gametocytes) of parasite. During the observation the patients took no food (only water), except one who took milk.

One hour before the onset of the fever leucopenia commenced, the number of leucocytes reaching its minimum during the ascent of the fever. After the febrile attack the number of leucocytes became normal. Before and during the attack there was a relative increase of the leucocytes having horse-shoe shaped or segmented nuclei (Schilling) with decrease of lymphocytes and large mononuclears. At the end of the attack and afterwards the contrary is observed, leading to monocytosis. In one case of chronic malaria with atypical fever a synchronous increase of leucocytes having horse-shoe shaped nuclei and of large mononuclears was observed.

The schizogony of the parasites, lasting 6–8 hours, took place during the decrease of the number of leucocytes, and was finished before the height of the fever was reached. No signs were observed indicative of a retention in the internal organs of parasites in course of schizogony. Female gametocytes were much more numerous than male; between the numbers of both there seems to exist a constant relationship.

N. H. Swellengrebel.

KNOWLES (R.), ACTON (Hugh W.) & GUPTA (S. A. S. Biraj Mohan Das). **A Note upon Spleen Puncture Findings in Malaria.**—*Indian Med. Gaz.* 1923. May. Vol. 58. No. 5. pp. 211–213. [3 refs.]

In fifteen cases having enlarged hard malarial spleens, splenic puncture recovered few if any viable parasites, an occasional crescent, more frequently abundant haemozoin, and proved of no diagnostic value in malaria. No evidence of intrasplenic phagocytosis emerged. It is held needless to postulate an unknown relapse-producing body [this *Bulletin*, Vol. 20, p. 776] of which no evidence was or has been forthcoming, the matter being explicable by the varying proportion of parasites destroyed by the host. If 98 per cent. of each generation be destroyed cure without relapse is probably assured. If the proportion be only 95–96, numbers are kept below the fever threshold, aided by the brake-like action of gametocyte formation; but should for any reason the host's power of destruction be lessened, schizogony rapidly produces a febrile dose of merozoits.

C. L.

VELDEE (M. V.). **Spleen and Blood Examinations for Malaria. A Study of the Relative Merits of the Spleen and Blood Parasite Indices for determining Malaria Prevalence as found in Dunklin County, Mo.** —*Public Health Rep.* 1923. July 13. Vol. 38. No. 28. pp. 1574–1580. [5 refs.]

This investigation continues, checks and elaborates that of MAXCY and COOGLE [this *Bulletin,* Vol. 20, p. 551]. The same area was covered, but girls were examined as well as boys, and both spleen and blood were investigated in 880 children. Twenty-one were positive in both blood and spleen, 25 in blood only and 24 in spleen only; so that although 70 gave evidence of infection, in only 46 were parasites found, and in only 45 was the spleen palpable. Age from six upwards had no definite influence upon the indices, but it was pointed out that nearly all had taken quinine, in marked contrast to the conditions generally prevailing in India. "We may conclude that in this particular community, at least, the two indices have the same value in measuring malaria prevalence. The ease and rapidity of application of the spleen method are much in its favour."

C. L.

ROSENBURG (Albert). **Zur Differentialdiagnose der chirurgischen Abdominalerkrankungen und der Malaria tropica.** [Differential Diagnosis of Surgical Affections of the Abdomen and Malaria tropica.]—*Deut. Med. Woch.* 1923. June 22. Vol. 49. No. 25. pp. 811–814. [12 refs.]

In a case diagnosed as peritonitis, operation revealing no such condition, death occurred on the third day from collapse. At autopsy the capillaries were found filled with malaria parasites and pigment. In a second case, delay for further observation before laparotomy revealed, in one who was suffering from hypochondriac pain, malaria parasites in the blood, cure following quinine administration. Both had received salvarsan. The necessity, in obscure cases in Germany, of bearing malaria in mind is again urged. One assumes from the title that both cases were infected with *Plasmodium falciparum,* although this is only stated of the second.

C. L.

NEUMANN (Paul). **Zur Diagnose und Therapie der Malaria tropica in Deutschland.**—*Med. Klinik.* 1923. May 27. Vol. 19. No. 21. pp. 723–724. [15 refs.]

The general lack of appreciation of the presence of malaria in Germany is evidenced by yet three more cases. The first was a man who for nearly four years lay in, or attended, hospitals with severe headache, body-wide pain and shivering, was looked upon as a neurotic, had his nasal septum removed—without advantage—underwent a course of salvarsan, and after the fourth injection died. The first suspicion of malaria was a glimpse of brain capillaries blocked with pigment and parasites. In the second case also the diagnosis was post-lethal. In the third parasites were discovered in the blood during life and he recovered under quinine, the schizonts disappearing from the peripheral blood in four days. Because the crescents persisted for 14 days, quinine resistance is held established, a resistance considered to have been broken down by injection of 40 cc. of argoflavin.

C. L.

RIVET (Lucien). **Sur quelques cas de paludisme autochtone.**—*Presse Méd.* 1923. Sept. 22. Vol. 31. No. 76. pp. 805–806. With 2 charts in text. [2 refs.]

Two cases are reported from Pas-de-Calais, cousins occupying the same room, whose fevers ran identical courses, the one where she was infected, the other after her removal to Paris. In Paris *Plasmodium vivax* was detected. The other, under telephonic instructions from Paris, was quininized without microscopic examination, but the diagnosis of benign tertian malaria cannot, in her case also, be seriously questioned. Two possible sources of infection close at hand were traced, and *Anopheles bifurcatus* was particularly annoying at the place. Three more autochthonous cases are reported from Paris. In two the infection was with *P. vivax*, in the third also apparently so.

C. L.

CIGNOZZI (Oreste). **La splenomegalia malarica e le sue complicazioni.** —*Policlinico.* Sez. Chir. 1923. Feb. 15. Vol. 30. No. 2. pp. 57–68.

Cignozzi records 17 cases of malarial splenomegaly. One spontaneous and one traumatic rupture died without operation, and one splenic abscess died after operation. In all the other cases, including six of splenectomy, operation was undertaken and recovery followed. In the splenectomies the leucocytic count, at first a typical leucopenia, passed after two or three months into a condition of marked mononuclear increase, and after five or six months to a normal picture, and a predisposition to septic infection is held established. Splenectomy cannot be depended upon to prevent relapse, especially of subtertian malaria.

C. L.

i. MACRAE (Donald Mackenzie). **Observations on Benign Tertian Malaria: its Incidence, Sequelae, and Treatment. No. I.**—*S. African Med. Rec.* 1923. July 28. Vol. 21. No. 14. pp. 318–324.

ii. ——. **Observations on Benign Tertian Malaria: its Incidence, Sequelae, and Treatment. No. II.**—*Ibid.* Sept. 22. No. 18. pp. 424–426.

i. These notes, based upon 18 years' experience of the Bechuanaland Protectorate, stress the observation that malaria does not necessarily conform to type. The effects of cold, heat and moisture in producing infection or relapse are considered; while less orthodox concomitants of infection mentioned are bleedings, sore throat, supraorbital neuralgia and headache, lumbago, bronchitis, pneumonia, dysentery and facial oedema. ii. Deals with tropical neurasthenia.

C. L.

MIXSELL (Harold R.). **Malaria in a 3½ Year Old Boy.**—*Arch. of Pediatrics.* 1923. May. Vol. 40. No. 5. pp. 339–341.

A boy of 2½, a lifelong resident of New York State, had an "epileptiform convulsion," a condition recurring at long intervals during the next year. Daily attacks of a different character then supervened, the temperature rising to 104° F., with headache, abdominal pain, enlarged spleen, haemoglobin index 35, erythrocytes 2,400,000, and a double benign tertian infection, clearing up under 12 grains of quinine daily continued for two months.

C. L.

STEPHENS (J. W. W.). **Studies in the Treatment of Malaria.—XXXII. Summary of Studies I–XXXI.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 303–316. With 4 charts.

A positive parasitic diagnosis before beginning treatment, and thereafter a daily microscopic examination during treatment and for the subsequent 60 days of observation during which treatment absolutely ceased, form the basis of the long series of studies here summarized. About four-fiths of relapses in simple tertian malaria occur within 20 days of the cessation of treatment, 95 per cent. between 7 a.m. and 7 p.m., and 20 per cent. at 2 p.m. Using the same treatment, if 40 per cent. of relapses occur in cases treated during summer and autumn over 90 per cent. will occur in those treated during winter and spring. The maximum tolerated dose of quinine sulphate was 120 gr. on each of two consecutive days.

For the removal of *Plasmodium vivax* from the cutaneous blood, with concomitant relief of symptoms, the following suffice :—A solution of quinine sulphate orally in doses of 10 gr. on each of two consecutive days, although usually 15 gr. two or three times a day were given until this result was achieved ; intramuscular injection on each of two consecutive days of 15 gr. of quinine bihydrochloride in 2 cc. of water, or of 15–30 gr. of quinine alkaloid dissolved in 1 cc. of sesame oil ; one to six intravenous injections of 10–15 gr. of quinine bihydrochloride in ten times the quantity of normal saline ; a single intravenous injection of 0·9 gm. of arsenobillon ; a single intravenous injection of 0·2 gm. of luargol.

For *P. falciparum*, intravenous injections of quinine and arsenobillon, as above, proved useless, both trophozoits and gametocytes persisting.

For *P. malariae* arsenobillon was useless.

Other drugs tested without benefit were liquor arsenicalis, tartar emetic, collosal manganese, quitenin, quinotoxin, amylopsin and trypsin.

With a view to maintaining the cutaneous blood free from parasites and the patient free from symptoms while treatment continues, the investigation showed that when a given quantity of quinine was administered weekly, say 30, 60 or 90 gr. [2, 4 or 6 gm.] the results were better if half of it were given on each of two consecutive days than if one-sixth were given daily for six days. The best results were obtained from 90 gr. given in 15-gr doses three times a day on two consecutive days, an equally good one following the administration of 15 gr. of quinine bihydrochloride intramuscularly on each of the first two days and thereafter 30 minims of liquor arsenicalis daily for three fortnightly periods, treatment being suspended for a week between each such period.

Freedom from relapse for 60 days after treatment ceased was best accomplished by one of two methods. The first, that just described as being the most satisfactory method of preventing relapse during treatment ; the second, novarsenobillon 0·9 gm. on days 1, 8 and 15, and quinine bihydrochloride intramuscularly on days 1, 2, 8, 9 and 16. Under quinine in doses of 30–45 gr. daily, crescents rarely persisted for more than three weeks ; controls were not used ; doses of 30 gr. on each of two consecutive days weekly for five weeks were not so successful.

C. L.

BAERMANN (G.). **Malaria und Malariabehandlung. (Abortivbehandlung.)**—*Muench. Med. Woch.* 1923. May 11. Vol. 70. No. 19. pp. 587–589 ; and May 18. Vol. 70. No. 20. pp. 637–640.

This very laborious investigation of over 1,100 cases, each examined once or twice daily mostly in thick drop preparations for 60 days, was begun in 1912 and carried out where reinfection could not be excluded. The results are unfortunately given in a form not easy to analyse, but they confirm the conclusions reached by others that intravenous quinine is of minor value in producing sterilization, whether combined or not with salvarsan.

	Percentage of relapses.				
	P. falciparum.		*P. vivax.*	*P. malariae.*	
	Schizonts.	Gametes.	Schizonts. Gametes.	Schizonts. Gametes.	Average.
Intravenous quinine ..	62	100	47	100	66
Intravenous salvarsan..	90	98	51	71	70
Intravenous quinine and salvarsan	65	82	46 [?]	43	59
Oral quinine, ½ gm. daily in 2 doses, for 2 months	60	—	25	20	50
As above for 4 months..	35	—	15	15	25

The percentage table reproduced is valuable, even though the actual figures are not given, but it hardly warrants the definite statement made that quinine alone in whatever form and dose it may be given will not cure subtertian malaria with crescents, or quartan malaria.

C. L.

LE DENTU (R.). **Au sujet du comprimé de quinine.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 567–568. [4 refs.]

A woman, diagnosed as having subacute appendicitis, passed 17 unaltered tablets of quinine in 48 hours. She had taken two daily and six immediately previous to examination. Le Dentu forwarded specimens to the Society in support of his contention that their quality was not at fault. LEGER, however, points out that they are unsoluble in and unchanged in water, that they consist of the basic sulphate ; so that confidence in tablets of the hydrochloride of good quality is unabated.

C. L.

NUÑEZ (M. F.). **The Treatment of Malaria.**—*Amer. Jl. Trop. Med,* Baltimore. 1923. July. Vol. 3. No. 4. pp. 269–287.

Postulating that the accepted death-rate from malaria generally is 2·89, in pernicious malaria 26·6 per cent., and that his own figures in 8,000 cases are 0·2 and 6 per cent. respectively, Nuñez details the treatment which, he holds, has produced this diminution in mortality. Although quinine is given pride of place as the all-recognized specific, yet the salvarsans are held to abort promptly acute attacks in all forms of malaria and to be specific in the tertian field. Colloid quinine in doses of 1 gr. (0·065 gm.) is held therapeutically equivalent to 15 gr. (1 gm.) of ordinary quinine salts, and to be non-toxic.

C. L.

Bass (C. C.). **The Standard Treatment for Malaria.**—*New York Med. Jl. & Med. Rec.* 1923. June 20. p. 740.

Bass deals here with supposed resistance to quinine, that is, with cases which under the Standard Treatment recommended by the U.S. National Malaria Commission [this *Bulletin*, Vol. 18, p. 97] have received during an acute attack 10 gr. of quinine sulphate by mouth three times a day for three days without the attack being cut short. During the last year only four such cases have come to his personal notice. In one there was coexistent typhoid ; in two the quinine had not been given as prescribed ; in the fourth the diagnosis had been made by the laboratory man on one doubtful parasite found in one of many blood examinations made. In this case, a woman, fever and chills continued for weeks and disappeared without a diagnosis being made. " It was not malaria."

C. L.

Fidao (G.). **Au sujet de la communication du Dr. Nogue sur la posologie infantile de la quinine.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 436–437. [1 ref.]

Fidao agrees with Nogue [this *Bulletin*, Vol. 20, p. 301] that the dosage of quinine for infants is too small. He gives 0·08–0·1 gm. of formate of quinine daily per kilo of body-weight without ill-effect. In discussing the matter, Leger points out that the Standard Treatment of the United States [this *Bulletin*, Vol. 18, p. 97] is 0·3 gm. for a child of under 1 year, but insists that neither Fidao nor Bass takes cognizance of an essential matter, the species of parasite concerned. For *Plasmodium vivax* readily disappears from the peripheral blood under quinine, but constantly relapses ; whereas with *P. falciparum* the driving of the parasite from the peripheral blood is difficult, but a full course of quinine is likely to be followed by sterilization. Of *P. malariae* he is not, from his experience, able to speak with exactitude. Now that the facts pointed out by Wenyon [this *Bulletin*, Vol. 19, p. 98] and by Acton and his collaborators [Vol. 18, p. 335] have been accepted, or independently reached by Leger (there is nothing in the paper to indicate which position is correct), it is to be expected that their recognition will be more rapidly diffused than has been the case hitherto.

C. L.

i. Fletcher (William) & Visuvalingam (S. A.). **Intramuscular Injections of Quinine.**—*Trans. Malaya Branch Brit. Med. Assoc.* Session 1922–23. No. 11. pp. 10–22. [30 refs.]
ii. Fletcher (William). **Rectal Injections of Quinine.**—*Jl. Trop. Med. & Hyg.* 1923. July 2. Vol. 26. No. 13. pp. 229–230. [5 refs.]
iii. Newham (H. B.). **Administration of Quinine** *per rectum.* [Correspondence.]—*Ibid.* Aug 15. No. 16. p. 272.

The papers by Fletcher and Visuvalingam comprise two chapters of a book elsewhere reviewed which contains striking photographs omitted from the separate publications.

i. The encountering within a short period of three appalling mutilations following intramuscular injections of quinine lead to investigations of its therapeutic value. Urinary excretion indicates that quinine is absorbed from muscles somewhat less rapidly and evenly than from the alimentary canal, but this excretion does not continue for longer after intramuscular than after oral administration, so that the former has no advantage in prolonging the period of action. The necrosis which inevitably follows an intramuscular injection may be catastrophic if sepsis occur or if large vessels or nerves be affected; so that the medical man should not throw the responsibility for its actual administration upon others, and should limit this to cases where there is inability to swallow or retain an oral dose.

ii. In five men given 30 gr. of quinine hydrochloride per rectum in 2–4 ounces of water there rapidly ensued severe pain, tenesmus, and passage of blood and mucus continuing for from 1 to 5 days, with in one case collapse. Diluted to 15 ounces with starch and opium solution the results were but little better. No quinine appeared in the urine.

iii. Newham draws attention to his long experience of quinine bihydrochloride dissolved in normal saline, rectally administered, with no symptoms comparable to those described by FLETCHER, and to evidence of its therapeutic value. He adds that from his experience quinine can be given per rectum with perfect safety and marked efficiency. One is compelled, it seems, to look beyond the quinine for the symptoms which attacked FLETCHER's cases.

C. L.

LEGER (M.) & BÉDIER (E.). **La quinine agit-elle sur les schizontes de *Pl. vivax* au stade intraglobulaire?**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 433–435. [4 refs.]

In a relapse of tertian malaria occurring in one of the writers, quinine was taken for the first time sixteen hours after the initial rigor—3 gm. of the hydrochloride in two days. During that period the growth of parasites was arrested but they persisted in undiminished numbers in the peripheral blood. Nothing, it is concluded, is to be gained by giving quinine during fever.

C. L.

SINTON (J. A.). **The Treatment of Malaria by Quinine in Combination with Magnesium Sulphate and Alkali.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 406–415. [21 refs.]

The theoretical considerations which lead up to Sinton's experiments [this *Bulletin*, Vol. 20, p. 300], their details and results are considered. For his acid mixture he now uses citric in place of sulphuric acid, since it ultimately tends to an alkaline reaction.

C. L.

FIORENTINI (Augusto). **La cinconina nella cura della malaria dei bambini.**—*Policlinico.* Sez. Prat. 1923. Aug. 6. Vol. 30. No. 32. pp. 1025–1031. [9 refs.]

Experience of the administration of cinchonine hydrochloride to 11 children aged from 3½ months to 12 years, and to one woman, leads to the conclusions that the drug is easy to administer and especially useful in tertian malaria. Its capacity for preventing relapses, particularly of subtertian malaria, is held as still uncertain.

C. L.

ESCOMEL (E.). **A propos du traitement du paludisme dans les vallées malariennes du Pérou.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 308–313.

Diagnosis in these cases was made by drawing into a centrifuge tube nearly full of 2 per cent. glacial acetic acid 1–3 cc. of blood, centrifuging, washing with physiological serum, again centrifuging and staining with " argentoratum of Guimaud of the University of Strasburg." Treatment of pernicious attacks was by subcutaneous, of acute attacks by intravenous, injection of bihydrochloride of quinine, together with oral treatment.

C. L.

CASTAGNA (P.). **[Quinine Treatment of Pregnant Malarial Patients.]**—*Rivista di Ostetricia e Gynecologia Pratica.* 1923. June. p. 268. [Summarized in *Brit. Med. Jl.* 1923. Sept. 22. (Epitome of Current Medical Literature.) p. 40.]

In 37 pregnant women given quinine in doses of 0·25 to 0·5 gm. by mouth none gave anxiety. Of 20 given 0·5–1 gm. by injection two, in the 8th and 9th months with hyperpyrexia, miscarried ; while abortion threatened in one at 3 months.

C. L.

PAIS (A.). **La radiothérapie employée comme excitant dans le traitement du paludisme. Sa fonction sociale.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 244–249.

An experience of 2,000 cases in six years carries for the writer complete conviction. He makes no attempt at destruction of parasites by the rays, but finds that their application in minute doses, possibly for a few seconds only, reduces fever, enlargement of the spleen and anaemia, and so improves the general health that in cases where quinine has become useless it now cures. Large doses are harmful, having the opposite effect, while that of small ones is held comparable to the benefit obtained from altitude, so that the shortness of the exposure required allows of his bringing daily many mountains to many Mohammeds.

C. L.

MANOUKHINE (I. I.). **Traitement du paludisme par les irradiations de la rate d'après la méthode de l'auteur.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 80–92. With 6 charts. [7 refs.]

Twenty-three cases of tertian malaria, 10 of quartan, 11 of subtertian, 4 of mixed tertian and subtertian, and 2 judged to be malaria although parasites could not be found, were, on the day before the expected access, submitted to X-rays for five minutes with a bulb of 8 hardness, the dose being 1H. Apparently quinine was withheld. Cure is claimed for all. Of 3 cases detailed one required 16 sittings, the second 9 and the third 12 before the temperature fell to normal.

C. L.

GUNN (J. A.) & MARSHALL (D. G.). **The Harmala Alkaloids in Malaria.**—Reprinted from *Proc. Roy. Soc. of Edinburgh.* Session 1919–20. Vol. 40. Part 2. (No. 15.) pp. 140–149. With 4 figs. [Received Sept., 1923.]

Peganum harmala, reported by HILTON-SIMPSON as being used internally by the Algerians for syphilis and externally for septic wounds, contains in its seeds two alkaloids, harmaline ($C_{13}H_{14}N_2O$) and harmine ($C_{13}H_{12}N_2O$), closely related chemically and pharmacologically, but the latter about half as toxic as the former, whose lethal dose for guinea-pigs is 0·1 gm. per kilo. Harmaline kills paramoecium in 20 minutes in a dilution of 1 in 20,000, and its minimum lethal dose would not hinder its exhibition in quantities which might reasonably be expected to produce this degree of concentration in the blood. Tested *in vitro* on *Trypanosoma lewisi,* a solution of 1 in 4,000 left a few of them apparently unscathed after 5½ hours. Even in a concentration of 1 in 1,000 some few were not rendered immobile. *In vivo* two rats injected with blood, derived from a confrère infected with surra, which had been incubated for an hour at 37° C. in a 1 in 3,000 harmaline solution, died as rapidly as did controls. In ten cases of benign tertian malaria and in one of malignant tertian in Peshawar, Punjab, India, this salt was given in doses of 2 gr. daily, increased to 2 gr. twice a day if tolerated. In five of the cases the temperature fell and parasites disappeared from the blood in from 3 to 6 days. In one more relapse followed apparent cure. In five the disease was not checked. In six the drug caused nausea and giddiness. Ready cure followed the administration of quinine in the cases where harmaline failed.

Marshall reports the effects of harmine, supplied by Professor Gunn, and exhibited in doses of 3 gr. daily. In acute cases it proved ineffectual. In three relapsing cases, one with benign, one with subtertian and one with both these infections, it seemed to act much better than did quinine in preventing relapses. No untoward symptoms are reported as having occurred after its administration. It is stated that both alkaloids could safely be given in much larger doses, but in view of the consideration that nausea and giddiness followed 2-gr. doses of harmaline, and that harmine in animals is half as toxic as harmaline, this conclusion will perhaps be accepted for both alkaloids with some caution.

C. L.

WAGNER-JAUREGG. **The Treatment of General Paresis by Inoculation of Malaria.**—*Jl. Nervous & Mental Dis.* 1922. May. Vol. 55. No. 5. pp. 369–375.

Dealing historically with the effects of intercurrent infections and injected toxins upon general paralysis of the insane, the paper has also direct bearing on inoculated malaria. In 200 transmissions, 37 in direct descent, the first one being an untreated autochthonous Vienna case of infection with *Plasmodium vivax* occurring in 1919, there has never appeared anything but *Plasmodium vivax.* The amount of blood injected to produce transmission has been 1–4 cc., and the route has been subcutaneous. Blood taken between attacks has been as effective as blood taken during them. In some cases no infection followed the first injection, although a second proved effective. In a few cases even three or four injections failed to cause infection, so that certain persons appear immune, at least to inoculated malaria. After 10–12 febrile attacks, 1 gm. of quinine daily for 3 days, and thereafter 0·5 gm. for 14 days completely cured all cases, six weekly injections of neosalvarsan being, however, added.

C. L.

WEBER (H. H.). **Wat leert ons de kunstmatige overdraging van malaria?** [What does Artificial Transmission of Malaria teach us?]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 234–238. [3 refs.]

Weber gives an account of the results of MÜHLENS and KIRSCHBAUM [see this *Bulletin,* Vol. 20, p. 295] with therapeutical infection with malaria of sufferers from general paralysis of the insane. Apart from the facts mentioned in the summary referred to, the following items are interesting. Infection never succeeded with blood containing only gametocytes; thus nothing was seen speaking in favour of SCHAUDINN's "parthenogenesis." Quinine given to a donor before taking his blood did not render it harmless for the receiver, neither did a quinine solution 1 : 5,000 *in vitro* kill the parasites. These observations are against a direct influence of quinine on the plasmodia and in favour of MORGENROTH's views of the pharmacodynamic action of the drug [see this *Bulletin,* Vol. 13, p. 81].

W. J. Bais.

KIRSCHNER (L.). **Inoculation of Malaria in Cases of General Paralysis and Frequency of the Latter Disease in the Dutch East Indies.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Pt. 2. pp. 192–206. With 1 text fig. [31 refs.]

——. **Over de malaria enting bij Dementia paralytica en de frequentie dezer ziekte in Nederlandsch-Oost Indië.** [On the Infection with Malaria in General Paralysis of the Insane and the Frequency of this Disease in the Dutch East Indics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 303–323. With 1 fig. [28 refs.]

This paper deals largely with the historic details of the treatment of general paralysis of the insane by the induction of an acute attack of malaria, and with the valuable personal experiences of one who, under WAGNER VON JAUREGG, made the latter's first experimental injections [see above]. Clearly, if malaria cures general paralysis, this disease should be rare where malaria is rife, and those with asylum experience in India will probably agree that facts there fall in with this logical conclusion. For the Dutch East Indies Kirschner analyses the figures of four asylums. These are, however, so variable that one must conclude that the personal element has entered so largely into diagnosis that sound conclusions are not safely deducible.

C. L.

KIRSCHBAUM (Walter). **Methoden und Kautelen einer Malaria- Blut-Konservierung und -Versendung zur Behandlung der progressiven Paralyse nach Beobachtungen an Tertiana-Plasmodien in Vitro und an Impfversuchen.** [Methods and Precautions for the Preservation and Despatch of Malarial Blood for the Treatment of General Paralysis, after Observations on Tertian Parasites in Vitro and Inoculations.]—*Klin. Woch.* 1923. July 23. Vol. 2. No. 30. pp. 1404–1406. [9 refs.]

A number of interesting points emerge regarding *Plasmodium vivax*. After withdrawal of blood the parasite survives therein for 1 to 3 hours at 25° C., dies in about 3 hours at 45–50° C. and remains viable up to 26 hours at 37–39° C., in all cases the conclusion being based upon the effects produced by injecting the blood subcutaneously in quantities of 3–5 cc. into a paralytic. Dextrose increases its longevity. Transport in a thermos flask, or even in the waistcoat pocket, is a practical measure. After mixing *in vitro* quinine solution of a strength of 1 in 5,000 with an equal quantity of blood and keeping the mixture in the incubator for 5 to 24 hours, it remained infectious in every case. A mixture of 2 to 4 cc. of a 0·45 per cent. solution of neosalvarsan with 2 cc. of blood containing *P. vivax*, kept in the incubator for 3 and for 6 hours, was infective. In four cases kept for longer, up to 24 hours, this was not so.

C. L.

SANDS (Joseph Evans). **A Review of an Early Paper on Malaria.**—*Ann. of Med. History.* 1923. Mar. Vol. 5. No. 1. pp. 77–79.

An article by Drs. J. Forsyth MEIGS, Edward RHOADS and William PEPPER on " The Morphological Changes in the Blood in Malarial Fever with Remarks on Treatment," appearing in *The Pennsylvania Hospital Reports*, v, i, (1868), shows that they frequently observed the malaria parasite in most parts of the body without realizing that they did so. " In the splenic pulp we satisfied ourselves of the existence of red blood globules in different stages, not only of disintegration, but also of advanced metamorphosis towards black pigment, and are therefore prepared to agree with FRERICHS [1854] that these different colours represent the various stages in the transformation of the red pigment of the blood into melanotic matter. We have occasionally seen tinged gelatinous particles as though there were a union between the colouring matter [that is the pigment] and some protein element." It is clear how nearly these American observers anticipated LAVERAN's discovery of 1880, missing it by that apparently little mental step which is the essential in such matters.

C. L.

LAL (R. B.). **The " Aldehyde Test " in Malaria.**—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. pp. 369–371. [10 refs.]

The " gel " formalin test, advised for kala azar, was tried in malarial cases in Lahore. Kala azar is unknown there, and none of these persons had evidence of present or previous cutaneous leishmaniasis. In some a certain opacity occurred, but in none was there solidification as judged by NAPIER's standards.

C. L.

SALVIOLI (Gaetano). **Le sieroreazioni della sifilide nella malaria.**—*Gazz. d. Osped. e d. Clin.* 1923. Apr. 22. Vol. 44. No. 32. pp. 374–376. [16 refs.]

In a total of 101 malarial sera, 83 of them collected during an exacerbation, four syphilitic tests were compared : (1) The Bordet-Wassermann reaction ; (2) the Sachs-Georgi reaction in isotonic sodium chloride solution, making the reading after 3, 24 and 48 hours in the incubator; (3) the third modification of Meinike's reaction; (4) the Sachs-Georgi reaction in the incubator for three hours and at room temperature for one. His findings are that certain sera from persons with acute malaria give a weak Wassermann reaction, and he advises that in a malarial region the Sachs-Georgi or Meinike reactions should be substituted for, or at least added to, the Wassermann test as a check upon nonspecific reactions produced by the latter. C. L.

GARIN (Ch.) & AFFRE. **Étude du sang chez les paludéens.**—*Lyon Med.* 1923. Apr. 25. Vol. 132. No. 8. pp. 327–341. [28 refs.]

GARIN (Ch.). **Étude sur les éléments figurés du sang dans le paludisme.** —*Rev. Prat. Malad. des Pays chauds.* Paris. 1923. June. pp. 229–239. [20 refs.]

These papers are largely identical. An analysis of 4,000 cases of malaria observed at an altitude of 1,000 metres confirms work already accepted. Special tests, carefully executed, indicate that malaria actually increases somewhat the resistance of erythrocytes to haemolysis. In 272 cases the leucocytes during apyrexia averaged 5,347 per cmm., the access in 247 adding an average of 798 per cmm. A differential count of 462 cases during apyrexia showed polymorphs 59·2, eosinophils 3·1, large mononuclears 17, small mononuclears 12·7, lymphocytes 8; while in 525 the corresponding figures during paroxysm were 67·2, 1, 17·8, 10 and 4. Myelocytes indicate a grave anaemia. Published work on arterial pressure and serum reactions is critically considered, and these papers, particularly the first, will be consulted by those desiring a critical consideration of the present position and an indication of the directions in which advance may profitably be attempted. C. L.

i. ALFARO (Soto). **Algumas formas graves de paludismo visceral.**—*Amazonas Med.* Manáos. 1922. Year 4. Vol. 4. Nos. 13–16. pp. 148–152.

ii. MONTANARI (Manlio). **L'infezione malarica nella chirurgia.**—*Policlinico.* Sez. Prat. 1923. Aug. 20. Vol. 30. No. 34. pp. 1099–1100.

iii. OVAZZA (V. E.). **Influenza della malaria in chirurgia.**—*Ibid.* pp. 1100–1102.

iv. SPENCER (H. A.). **Malaria of the Middelvelt and Highvelt of the Transvaal.**—*Jl. Trop. Med. & Hyg.* 1923. Aug. 15. Vol. 26. No. 16. pp. 261–263.

v. SERGENT (Ét.) & CATANEI (A.). **Sur un cas d'anisocytose chez un paludéen.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Dec. Vol. 2. No. 4. pp. 478–479. With 1 chart.

vi. LEGER (Marcel) & BÉDIER (E.). **Index endémique du paludisme à Ouagadougou** [Upper Volta] **en saison sèche.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 383–385. [10 refs.]

vii. LEGER & BÉDIER (E.). **Notes brèves sur l'index endémique du paludisme dans la Haute-Volta.**—*Ibid.* July 11. Vol. 16. No. 7. pp. 556–557.

viii. REITANI (Ugo). **Sopra un caso di polineurite malarica grave.**—*Policlinico.* Sez. Prat. 1923. Oct. 15. Vol. 30. No. 42. pp. 1350–1352. [22 refs.]

ix. WENYON (C. M.). **The Mode of Transmission of Malaria: A Hypothesis Advanced by Richard Pfeiffer in 1892.**—*Lancet.* 1923. July 14. p. 68. [1 ref.]

i. Of the nine cases here cited only two showed parasites in the blood, one a case of pseudo-angina pectoris, and one of coma. The others (simulated malignant endocarditis, simulated mitral regurgitation, tachycardia, lobar pneumonia, acute and chronic enteritis, acute and chronic dysentery) were attributed to malaria either because attacks came on at a definite hour or because they yielded to quinine.

ii. A report of 38 cases in which a clinical diagnosis of post-operative malarial relapse is made.

iii. Instances are cited where traumatism, accidental or parturient, excited malarial relapse.

iv. Spencer here reiterates the reasons for his conviction that in the middle and high veldt malaria is a grave factor in public and individual health, and one which should not be ignored.

v. In a malarial Algerian child, aged 6 months, 210 erythrocytes were measured: 19 were of normal diameter, 134 of less, and 57 of more, than normal size, the extreme measurements being 2·5 and 12·7 μ.

vi. In the dry season, during March, malaria parasites were found in 21 of 46 children, or 46·6 per cent. *Plasmodium falciparum* accounted for 14, *P. malariae* for 7. *P. vivax* was absent.

vii. In May in the same place the parasitic index was at or near 100, the percentages of the various species being *Plasmodium falciparum* 83·6, *P. malariae* 14·9, *P. vivax* 1·5.

viii. Malaria parasites were not found. A Wassermann test could not be made.

ix. This paper has already received a short mention [this *Bulletin*, Vol. 20, p. 771]. Those interested in the history of medicine will appreciate Wenyon's reference to a conjecture which " appears to be one most logically argued, most accurately deduced, and nearest to the truth in the light of subsequent discoveries."*

C. L.

i. AIEVOLI (E.). **Iper-splenomegalia malarica e sue complicazioni.**—*Riforma Med.* 1923. Jan. 5. Vol. 39. No. 5. pp. 404–405.

ii. BANERJEE (Haran Chandra). **A Case of Fever due to *B. coli* Infection Simulating Malaria.**—*Calcutta Med. Jl.* 1923. Apr. Vol. 17. No. 10. p. 171.

iii. JOURNAL DES PRATICIENS. 1923. Mar. 31. Vol. 37. No. 13. pp. 205–206. **Le paludisme autochtone en Lorraine.** [N. F.]

iv. DUBA. **Rhumatisme polyarticulaire aigu d'origine paludéenne.** [Correspondence.]—*Ibid.* p. 208.

v. KITAEFF (F.) & IOFF (I.). **Ergänzung zur Frage " ueber Doppelinfektion u. Parthenogenesis."**—*Rev. Microbiol. & Epidemiol.* Saratov. 1922. Vol. 1. No. 3. pp. 292–293.

vi. STRÄUSSLER (Ernst) & KOSKINAS (Georg). **Ueber den Einfluss der Malariabehandlung der progressiven Paralyse auf den histologischen Prozess.**—*Wien. Med. Woch.* 1923. No. 17. pp. 783–787.

vii. ABBATUCCI (S. & C.). **La solution la plus approchée de l'extinction du Paludisme en Corse.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 485–490.

viii. CHEINISSE (L.). **La cinchonine dans le traitement du paludisme.**—*Presse Méd.* 1923. July 28. Vol. 31. No. 60. pp. 662–663. [11 refs.]

ix. EMILY (J.). **A propos de la lutte antipaludique à Beyrouth.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 481–483.

i. Seventeen cases of malarial spleens, excessively evident to palpation, fell into five surgical groups: ptosis with or without pedicular torsion; infarction and haemorrhage; hydatid; acute splenitis or peri-splenitis; traumatism.

ii. An autogenous vaccine caused rapid cure.

---

* Pfeiffer, R. (1892): Beiträge zur Protozoen-Forschung, I. Heft. Die Coccidien-Krankheit der Kaninchen, Berlin

iii. Two cases of microscopically established malaria, one caused by *P. falciparum*, occurring autochthonously in Lorraine indicate that the focus of infection, lighted during the war, still smoulders.

iv. A striking case in which swellings and gnawing pains of wrists, elbows and shoulders having a daily periodicity, persisting under salicylate of soda and salophene, disappeared rapidly under quinine. The blood was not examined.

v. A bald summary of conflicting opinions on "parthenogenesis" of malaria parasites.

vi. Histological examination of the central nervous system leads to the conclusion that malaria causes the lesions of general paralysis to become stationary. They cease to progress.

vii. The particular methods advised in this paper for Corsica, vexed by a multitude of counsellors, are gassing of the imagines, detailed destruction of breeding-places during the winter, and quininization.

viii. Taking as a text a case reported by FLETCHER & TRAVERS (*B.M.J.*, Apr. 14, 1923) in which quinine caused an exfoliative dermatitis without cure of the malaria, this consummation following rapidly when alkaloidal cinchonine was administered in capsules, Cheinisse points out the reasoned advocacy of this drug by Leonard ROGERS (1918) and ASCOLI (1919).

ix. LEGENDRE & LOUIS (*Bull. Soc. Path. Exot.*, 1923, p. 86) having found mosquitoes and malaria so rare in Beyrouth as to justify the termination of prophylactic measures, Emily, GOUZIEN and ABBATUCCI insist that the lack of malaria is directly due to those very measures, and point to the occurrence of serious cases just after the advice for discontinuation had been tendered.

C. L.

ARCE (Julian). **Ataque Pernicioso Hiperazoémico, causado por el** *Plasmodium Vivax*.—*Gac. Méd. Peruana.* 1923. Vol. 1. No. 3. pp. 57–60.

BERTRAND. **Contribution à l'étude du paludisme chronique dans ses manifestations nerveuses. Rôle du sympathique.**—*Bruxelles Méd.* 1923. July 12 Vol. 3. No. 37. pp. 856–860.

BOSE (Indubhushan). **Two Uncommon Cases of Malignant Tertian Infection.**—*Calcutta Med. Jl.* 1923. July. Vol. 18. No. 1. pp. 310–311.

CANTIERI (Collatino). **Sul probabile interessamento del fascio di conduzione atrio-ventricolare in alcune sindromi miocardiche da malaria.**—*Riforma Med.* 1923. Feb. 26. Vol. 39. No. 9. pp. 196–198.

VAN DONGEN (A.). **Malaria-typhus.**—*Nederl. Tijdschr. v. Geneesk.* 1923. Sept. 1. Year 67. 2nd Half. No. 9. p. 883.

MACHUTCHISON (G. B.). **Three Cases of Malaria.**—*Trans. Malaya Branch Brit. Med. Assoc.* Session 1922–23. No. 11. pp. 23–26.

REGNAULT (Félix). **Paludisme en Corse.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 92–93. [2 refs.]

YAKIMOFF (W. L.). **Sur la question du paludisme au Turkestan russe.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 243–244. [1 ref.]

TROPICAL OPHTHALMOLOGY.

NEWMAN (E. A. R.). **Berger's Stereoscopic Lenses for Ophthalmic Practice.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. pp. 107–109. With 4 text figs.

Newman calls attention to the great increase in the efficiency of ophthalmic work if some form of binocular loupe is employed for the examination of the front of the eye, and advocates the use of the Berger loupe for the purpose, giving the address at which the instrument can be obtained and the price to be paid for it. The advice is truly excellent, but in the reviewer's experience, and he has given a full trial to many forms of apparatus for the study of the front of the eye during the last twenty years or more, there is no instrument to touch the Zeiss corneal loupe for clearness of definition and for general utility. Whilst on this subject, it is germane to mention the corneal microscope which the same firm has recently placed on the market, and which, when used in combination with the Gullstrand slit-lamp, is revolutionizing ophthalmic diagnosis. Full information on the subject of both these instruments can be obtained from Messrs. Martin & Tomkins, of 51, Margaret Street, London, W.1, who are the London agents for Messrs. Zeiss.

R. H. Elliot.

TALBOT. **Diffusion épidémique de la conjonctivite à gonocoque.**—*Ann. Méd. et Pharm. Colon.* Paris. 1922. Jan.–Feb.–Mar.–Apr. Vol. 20. No. 1. pp. 13–18.

Gonococcal conjunctivitis, as seen in Indo-China, may spread in families, in limited areas, or in whole villages during July, August and September owing to the higher temperature and greater atmospheric moisture favouring the virulence of the organisms at that time of year. Unfavourable conditions of body hygiene predispose to the degree of infection in individual cases. Fingers and other soiled objects carry the infection from case to case.

R. H. E.

NICOLLE (Charles), CONSEIL (E.) & CUÉNOD (A.). **Vaccination préventive contre la conjonctivite aiguë à bacille de Weeks. Son importance dans la lutte antitrachomateuse.**—*C.R. Acad. Sci.* 1923. Aug. 6. Vol. 177. No. 6. pp. 382–384.

The authors consider that preventive inoculation against Koch-Weeks conjunctivitis has not received proper consideration in Europe owing to the fact that the type of infection there is so relatively mild. On the other hand, in lands where trachoma is rife, Koch-Weeks infection plays such an important part that prophylactic measures against it are of great importance. Both subcutaneous and subconjunctival vaccinations were employed, and the patients were then subjected to the instillation into the conjunctival sac of fresh cultivations of the Koch-Weeks bacillus without any serious symptoms supervening; whilst a control case showed typical infection. To those of us who know the havoc wrought by mixed infections in trachomatous patients, these observations must seem to be of very great importance.

R. H. E.

TALBOT. **L'Index trachomateux en Annam.**—*Bull. Office Internat. d'Hyg. Publique.* 1923. Mar. Vol. 15. No. 3. pp. 339–345.

Talbot is nothing if not methodical. He has set himself the task of working out the index of trachoma in Annam as a preliminary to a campaign in the schools for the elimination of the disease, and has discovered that it is much more prevalent among the people who live scattered in small communities on the dunes along the seashore than amongst those who are massed on the richer deltas. This, which at first sight seems an anomaly, is, he considers, to be explained by the influence of the sand driven along the dunes by the sea breezes ; the injuries inflicted on the cornea and conjunctiva by this agency pave the way for the diffusion of the virus of trachoma. A number of statistical tables are appended to the paper.

R. H. E.

BOUVIER (E.). **Le trachome dans la population rurale infantile du Nord-Annam.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. p. 299.

In four cantons of North Annam Bouvier found trachoma in from 32 to 49 per cent. of all the children examined, and he is deeply impressed with the menace to vision constituted by this state of affairs.

R. H. E.

PACALIN (M. G.). **Réflexions pratiques sur le traitement médical et chirurgical de la conjonctivite granuleuse.**—*Arch. Méd. et Pharm. Milit.* 1922. Oct.-Nov.-Dec. Vol. 77. No. 4. pp. 453–475. With 1 fig. [3 refs.]

This is not a treatise on trachoma, but an effort to place the author's wide practical experience of the treatment of this disease at the disposal of his old brother officers who are practising in the tropics, many of whom have not had a training in ophthalmology. Both the medical and surgical aspects of the subject are dealt with in a readable form, and no claim is made for anything new or startling. It is well suited for those for whose sake it was written.

R. H. E.

PETIT (Paul J.). **Recherches sur le trachome en Tunisie. (1er mémoire.)**—*Ann. d'ocul.* 1921. Vol. 158. pp. 567–579.

The statistics given show the appalling frequency of trachoma in the schools of Tunis, as many as 90 and 96 per cent. of cases being found in various centres. At one of these, corneal scars were present in 14 per cent. of the children ; in another in 29 per cent. and in another in over 59 per cent. As in other backward countries, the patients seemed little impressed with the seriousness of their condition and made comparatively little complaint ; it was mainly the corneal complications that drove them to seek assistance. There were striking cases of immunity in the eyes of much-exposed subjects. Petit saw several cases of the so-called " gelatinous trachoma," described by STELLWAG and others, and so familiar to workers in the East ; the lower lids were more affected than the upper. Trachoma is most commonly transferred in Tunis from individual to individual, though other methods of propagation are possible. Systematic treatment of all the infected, combined with their isolation so far as is possible, affords there, as elsewhere, the best prospect for the eradication of the disease.

R. H. E.

CLARK (Taliaferro). **The Trachoma Problem in the State of Minnesota.** —*Public Health Rep.* 1923. Mar. 2. Vol. 38. No. 9. pp. 383–403.

Those who are interested in the prevention and cure of trachoma should read this paper carefully. It cannot fail to impress them with the very thorough manner in which the State of Minnesota is grappling with a problem of national importance.

R. H. E.

PARROT (L.). **La lutte contre le trachome en milieu indigène rural. (Projet d'organisation.)**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1921. Mar. Vol. 1. No. 1. pp. 116–123.

Parrot points out that civilization, by its tendency to enlarge the urban population at the expense of the rural districts, has increased the incidence of trachoma amongst the Algerians and other natives. He remarks that, owing to its inclination to relapse, treatment of the disease in peripatetic clinics is of little value, and he suggests that the campaign against trachoma should be conducted on similar lines to that against tuberculosis.

He recommends that an eye dispensary should be established in every centre in which the population reaches 500 or over ; this should be chiefly supported by voluntary contributions. The dispensary would deal with the detection, the notification, and the simple forms of treatment of the disease ; patients requiring operative treatment should be referred to the larger hospitals. Education of the community in ocular hygiene should be carried out by each centre.

R. H. E.

COLLIN (Léon). **Rapport sur le trachome à Madagascar.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.–Feb.–Mar.–Apr. Vol. 21. No. 1. pp. 52–60. [2 refs.]

Trachoma has been introduced into Madagascar by Indians, and is being widely and rapidly disseminated there as a result of the total absence of hygienic precautions in the island. It is spread by direct contact and by the intermediary of flies. Energetic measures are called for to arrest this very serious invasion.

R. H. E.

LI (T. M.). **Trachoma in China.**—*Nat. Med. Jl. China.* 1922. Mar. Vol. 8. No. 1. pp. 1–10.

This paper deserves the careful study of every medical man who practises in the many tropical countries where trachoma is rife. The reviewer can remember no better description of the clinical course of this disease in the whole of his reading. Every line of it seems packed with useful information, the result of a large clinical experience ; the result is that it is impossible to abstract it ; it should, on the contrary, be read, underlined, and studied. Apart from the clinical description, a number of very interesting statements are made. It is estimated that from 15 to 20 per cent. of the population of South China suffer from trachoma, whilst in North China the figure rises to 50 per cent. or even higher. In the Peking Eye Clinic 65 per cent. of the cases come for trachoma or its complications. An examination of 1,475 persons in Peking showed that 58·3 per cent. of them were trachomatous. Li estimates that taking China as a whole one third of the people have the disease; that one in every hundred of the population is totally blind in both eyes from it, and another one per cent. in one eye. In addition, fully 10 per cent. of all those who have the disease have had their vision so reduced thereby that it is only with difficulty they can apply themselves to the most menial tasks of life. Trachoma, he says, is the greatest single cause of economic loss in China to-day. In forming this opinion he has come to the identical conclusion which the reviewer reached many years ago for India. Li blames the lack of personal hygiene for the spread of trachoma, and he especially indicts the indiscriminate use of common towels, basins, and various other household appliances. He says " We all know how general is the Chinese custom of using hot towels in restaurants and theatres and also while travelling by rail or steamer." He holds that direct contact with the lids by contaminated fingers or articles is necessary to produce infection. Tropical dust is a potent factor but only indirectly through its tendency to produce chronic conjunctivitis and so to pave the way for the attack of the trachoma germ. From his observation of children in Orphan Asylums he puts the incubation period of the disease at from 3 to 5 days. Trachoma may be fully developed in 2 or 3 weeks, or may progress slowly and insidiously and defy a positive diagnosis for a much longer period than this. He is strongly in favour of the energetic treatment of every doubtful case from the very first, believing as he does that early cases can be cured in a month or two, while late ones require six months to a year's treatment, and even then may recrudesce.

It is seldom that the reviewer has read a paper with which he can agree so heartily in every detail, or one which seems to him to be of so much value to the young medical man in the tropics. Once again he would urge every one of such to study this paper carefully.

R. H. E.

ABADIE (Ch.). **Nouvelle méthode de traitement des formes graves et invétérées de la conjonctivite granuleuse.**—*Rev. Prat. Malad. des Pays chauds.* Paris. 1923. Apr. pp. 134–142.

Abadie believes that a number of cases of trachoma resist the ordinary treatment (painting with silver nitrate, etc.) because the infectious element has made its way into the depth of the conjunctiva and especially into that part of it in the neighbourhood of the upper fornix. He accordingly rubs in a 1 in 500 solution of corrosive sublimate with a hard brush after making three or four longitudinal incisions into the conjunctiva at the fornix. To render this easy of performance, he everts the upper lid thoroughly with the aid of a special pair of forceps. If this treatment fails, he makes a number of galvano-punctures into the everted conjunctiva of the fornix after thorough eversion of the lid. Each puncture is 1 centimetre in depth. By repeated reintroductions of the cautery he aims at making a row of four or five subconjunctival burnt-out pits which he washes out with a 1 in 500 solution of perchloride of mercury. He asserts that there is no pain after the operation, and that the cure begins at once. The perchloride washing out is repeated at intervals for two or three weeks. Abadie claims wonderful successes as a result of this treatment, which he has demonstrated not only in his own clinic but also in Spain and in Northern Africa. BARRAQUEUR, MARQUEZ, ARMBRUSTER, and MORAX have testified to the excellent results from the Abadie treatment, of which they speak from practical experience and in very high terms.

R. H. E.

KAPUR (Devi Dass). **The Operative Treatment of Trachoma by Excision of the Fornix.**—*Indian Med. Gaz.* 1923. Apr. Vol. 58. No. 4. pp. 158–160.

The operation which Dr. Kapur advocates and which he has performed in a large number of cases, he learnt under Col. AINSWORTH at the Mayou Hospital, Lahore ; it differs in some details from the methods usually described. The steps of the procedure and other pertinent matters are set forth clearly, and admirable results are claimed. The indications for the operation are : (1) The presence of large follicles in the fornices and on the palpebral conjunctiva, and (2) any involvement of the cornea ; it must not be undertaken if the conjunctiva is extensively scarred or is becoming xerotic, or if acute intercurrent infections are present.

R. H. E.

DE MATTOS (Waldemar Belfort). **A cura da trichiasis e do entropion, pelo processo de Lagleyze.** [The Treatment of Trichiasis and Entropion by Lagleyze's Operation.]—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1920 & 1921. Oct.-Feb. Vol. 3. 2nd Ser. Nos. 8-12. pp. 299–304. With 1 plate.

The procedure is described at length and illustrated by clear diagrams. Local anaesthesia is employed ; it is claimed that the operation is very simple, rapid and neat ; there is no mutilation of the lids ; in fact it is an ideal method.

R. H. E.

BARTOLOTTA (E.). [**Che cosa intendo io per tracoma.**] [The Nature of Trachoma]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1922. Dec. Vol. 3. No. 12. pp. 316–318. [Summarized in *Ann. Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21. No. 1. pp. 97–98.]

Bartolotta would deny the specificity of all trachomatous manifestations. He does not believe that the granules are parasitic in origin. Such specificity as there is is to be attributed in his view to the anatomical constitution of the lids, and not to any specific activity of an invading organism. To the reviewer the idea in so extreme a form seems retrograde and likely, if adopted, to lead to a policy of stagnation from the point of view of investigation.

R. H. E.

VERWEY (A.). **A Case of Intra-Ocular Cysticercus Cellulosae.**—*Med. Jl. S. Africa.* 1923. May. Vol. 18. No. 10. pp. 250–252. With 3 text figs.

Cysticerci in man are either rare in South Africa or are seldom diagnosed there. In this case, though the possibility that it was a cestode tumour was taken into account, no positive evidence in support of such a view could be obtained, and a diagnosis of new growth was accordingly made; the eye was removed, and the cyst was found to be situated in the retina; the worm was believed to be dead; no other operation would have sufficed. Evidence is brought forward to show that cysticercus infection is not so rare in South Africa as has been thought. A recommendation is added that the complement-fixation test should be used in these cases.

R. H. E.

WRIGHT (R. E.). **Cysticercus of the Subconjunctival Tissues.**—*Indian Med. Gaz.* 1923. May. Vol. 58. No. 5. pp. 215–216. With 1 text fig.

Wright publishes the notes of this interesting case in which the cyst tore through the conjunctiva and "popped out" under accidental manipulation. Professor R. T. LEIPER diagnosed it as "a Cysticercus cellulosae, the hooks on the head of which were very abnormal." This is a rare condition in Madras. Wright states that the first case on record was by ELLIOT & INGRAM published in the *Indian Medical Gazette* for June, 1911. He can find no other records in the hospital, but has just met with another cyst of the same nature, of about the same size, and in the same situation (near the inner canthus). Of this he gives a rough drawing and promises a full report on a later occasion.

R. H. E.

WRIGHT (R. E.). **Optic Atrophy.**—*Brit. Med. Jl.* 1923. May 12. pp. 806–808.

Wright has been carrying on in Madras the admirable work on the study of optic atrophy commenced by KIRKPATRICK in the Government Ophthalmic Hospital. His communication should be read by all who study ophthalmology and especially by those of them who work in the tropics; it is thoughtful, orderly and systematic. The very helpful classification he gives obviously represents a great deal of careful observation, clear thinking and hard work. It is worthy of more than perusal, for it deserves to be thoroughly mastered by all who are interested in the subject. This paper will help materially to establish Wright's reputation for sound and useful work.

R. H. E.

FERNANDO (Antonio S.). **The Eye in Beri-Beri.**—*Amer. Jl. Ophthalm.* 1923. May. Ser. 3. Vol. 6. No. 5. pp. 385–388.

Fernando records the notes of three cases of eye symptoms in beriberi treated in the Philippine General Hospital at Manila. He is of opinion that this disease is a much more common cause of defective vision in the Philippine Islands than has hitherto been supposed. The older children and some of the adults there suffer from defective vision at night; to this condition the term "matang-manok" (chicken-eye) is commonly applied. As the conditions which in other countries commonly give rise to night-blindness are rare in the Philippines, and as the condition of the patients is otherwise healthy, he believes these to be slight cases of beriberi with ophthalmic complications, and he desires to draw the attention of his fellow practitioners to the subject. The chief complaints in the patients he has studied have been: (1) that the vision is foggy; (2) that the eyes are easily tired, especially at night; (3) that there is some measure of night-blindness, and (4) that the patient is easily dazzled by bright lights. Of some of the better-known eye complications of beriberi he has comparatively little to say.

R. H. E.

MUKERJEE (S. K.). **Ocular Complications of Malaria.**—*Calcutta Med. Jl.* 1923. June. Vol. 17. No. 12. pp. 241–253. [9 refs.]

The writer gives an excellent summary of the more modern views on the ocular complications of malaria, supported by references to a number of the recent works on the subject. Perhaps of most interest in the paper are his remarks on pareses of the motor nerves of the eyes; without actually endorsing these, the reviewer would recommend them to the attention of those who work in the tropics.

R. H. E.

CALHOUN (F. Phinizy). **Retrobulbar Neuritis of Malarial Origin.**—*Southern Med. Jl.* 1923. Feb. Vol. 16. No. 2. pp. 139–141. With 5 figs. [7 refs.]

Three cases of tertian malaria, negative to Wassermann's reaction, exhibited contracted visual fields, particularly for colours, one eye being predominantly affected, and a central scotoma the rule. Differentiation from quinine amblyopia rested on the history and on the absence of distension of the retinal veins. These cases cleared up entirely under 20 gr. of quinine bisulphate continued daily for about two months.

Clayton Lane.

FORSTER (Andrew E.). **An Experimental Study of the Pathogenesis of Quinin Amblyopia with Special Reference to Ethylhydrocuprein Hydrochlorid.**—*Amer. Jl. Ophthalm.* 1923. May. Ser. 3. Vol. 6. No. 5. pp. 376–380. [8 refs.]

In this posthumously published paper the work of other experimenters on the subject is first reviewed, showing that the toxic action of quinine is first manifested in the ganglion cells of the retina and is followed by degenerative change in the optic nerve. The writer's experiments on rabbits with quinine, with urea hydrochloride and with ethylhydrocuprein hydrochloride are next reported. The rabbit would appear to be a very unsuitable animal for all experiments of this nature, since only very slight retinal lesions were produced even when fatal doses were given. The moral would appear to be that future experimenters in this interesting field of work should select animals more suitable for their purpose.

R. H. E.

HAGEN (Sigurd). **Om oftalmologiens, saerlig staeroperationens utvikling i Norge.** [Cataract Extraction in Norway.]—*Norsk Magazin for Laegevidenskaben.* 1923. Vol. 84. No. 3. pp. 193–211. [13 refs.]

The principal feature of interest in this paper lies in the claim for a unique position taken up by the ophthalmologists of Norway, inasmuch as they use no bandages after extraction of a cataract. This technique was recommended by HJORT some 30 years ago, and with some modifications is still in use. The reviewer recalls the fact that the method was tried, but he believes soon abandoned, some decades ago in certain Indian hospitals. Whatever may be said of it in Norway, it is a quite unjustifiable method in the dusty and germ-laden tropics.

R. H. E.

MACGILLIVRAY (Angus). **Sub-Conjunctival Cataract Extraction.**—*Brit. Jl. Ophthm.* 1922. Aug. Vol. 6. pp. 351–360. [6 refs.]

The author found so much difficulty in performing an iridectomy under a conjunctival bridge that he has reverted to " the simple operation "—leaving the iris intact. In a few cases in which a preliminary iridectomy was done the operation was extremely easy. The advantages claimed for the method are: (1) that it is easy and rapid; (2) that it affords good protection from bacterial invasion; (3) that iris prolapse is prevented; (4) that the edges of the wound are brought into complete apposition, thus securing perfect healing of the scar. The reviewer doubts whether the method really prevents iris prolapse. In his own experience of the operation—and he does it almost always—the advantages are all that MacGillivray claims. An iridectomy can usually be performed at the time of the extraction, but the ideal method is to do a preliminary iridectomy, and a wide bridge extraction later. He would recommend this warmly to tropical ophthalmologists.

R. H. E.

KILLICK (Charles). **A Series of One Hundred Cases of Cataract removed under a Subconjunctival Bridge.**—*Brit. Jl. Ophthm.* 1923. July. Vol. 7. No. 7. pp. 320–327. [6 refs.]

Killick, in this posthumous paper, describes his technique for the removal of cataract under a subconjunctival bridge, and has much to say in favour of the method. He rightly admits that it demands a little more skill and experience than ordinary extraction, but does not believe that it leads to delay in healing, to haemorrhage into the anterior chamber, or to prolapse of the iris. The one contra-indication to it is a narrow palpebral fissure, as in such cases there is not room to make the bridge. The reviewer agrees with Killick in all these contentions and recommends his paper to the perusal of ophthalmic surgeons.

R. H. E.

ELSCHNIG. **[Extraction of Senile Cataract in the Capsule.]**—*Bericht der Deutsch. Ophthalm. Gesell.* Jena. 1922.

Those who cannot read Elschnig's interesting paper in the original should at least study BUTLER's excellent review of it in the *British Journal of Ophthalmology*, August, 1923, p. 383. He comments on the results of SMITH's " propaganda journey " through America as published by four well-known ophthalmologists, and in the light of these unfavourable reports he considers SMITH's operation to be unsuitable for adoption outside of India. He likewise speaks unfavourably of the Barraqueur operation. In the space at our disposal it is impossible to do more than direct the attention of ophthalmologists to this communication.

R. H. E.

VALOIS (G.) & LEMOINE (P.). **Remarques relatives au lavage du sac cristallinien au cours de l'opération de la cataracte. Reformation artificielle de la chambre anténieure.** [Lavage of the Capsule in Cataract Operations.]—*Ann. d'ocul.* 1923. Jan. Vol. 160. Year 86. pp. 28–34. [8 refs.]

The authors strongly advocate free lavage in the course of cataract extraction, and point out some of the many advantages of the method, which originated with McKEOWN, of Belfast, and was introduced into the Madras Ophthalmic Hospital over 21 years ago, with this difference, that whereas McKEOWN saved it for immature cataracts, the reviewer, impressed by the possibilities of the method, made it the routine procedure of that hospital, which it has continued to be ever since. It has always seemed strange that so valuable an addition to our cataract technique has been so little adopted by the profession at large. It is all that Valois and Lemoine claim for it and much more besides, and deserves a full trial at the hands of all who work in the tropics.

R. H. E.

SHANKER (Hari). **Vitreous Escape in Intracapsular Extraction of Cataract in Prominent Eye-Balls or Fat Patients.**—*Indian Med. Gaz.* 1923 June. Vol. 58. No. 6. p. 251.

The author advocates that, in the above classes of cases, firm manual pressure should be made backwards on the eyeball by a method which he describes. Great advantages are claimed in detail from the use of the method. The original paper should be consulted by those who are interested in the subject.

R. H. E.

GANGULY (S. K.). **Complications after some Cataract Operations.**—*Calcutta Med. Jl.* 1922. Dec. Vol. 17. No. 6. pp. 249–261.

This paper gives details of all the failures and of some of the successes met with in a total of 812 cataract and after-cataract operations. Such a record cannot fail to be both valuable and instructive, and should be read in the original by all who are interested in cataract operations in tropical countries. The reviewer welcomes it the more heartily because it is an evidence that Indian surgeons are taking careful notes of their cases, are analysing them and are learning the lessons that such material can teach. In his early days in India there was a most regrettable tendency, shared by some who ought to have known better, to think and act as if a careful compilation of statistics was impossible in that land of great opportunities. Such papers as this are a sign of the dawn of better things.

R. H. E.

ROLLET & BUSSY. **La cataracte noire.** [Black Cataract.]—*Arch. d'Ophthalm.* 1921. Feb. Vol. 38. pp. 65–82. [59 refs.]

Black cataract is so common in eastern practice that any paper dealing with it must be of interest to tropical workers. It affects the elderly and develops very slowly; it is characterized by an increase in the density of the lens fibres, which show no granulations, no globules, no destructive process, and no pigmentation. The black coloration is due to the presence of oxidized tyrosin in the interior of the lens. The authors consider that the prognosis is worse than that in cases of ordinary cataract. With this the reviewer agrees, but he has had so many highly satisfactory results from operations on this form of cataract that he would certainly recommend ophthalmologists in the East to take the risk and to operate freely despite the fact that their figures for this form of lens extraction will be worse than those of uncomplicated cases. After all it is the patient that matters, and not the statistics.

R. H. E.

LISTER (A. E. J.). **A Preliminary Note on an Investigation as to the Actual Weight of the Cataractous Lens, together with some Clinical Notes on Cataract.**—*Indian Med. Gaz.* 1920. Mar. Vol. 55. pp. 84–87.

Lister weighed 80 cataractous lenses extracted in their capsules in India, the average age of the patients being 56. The most striking feature of the series lay in the wide variations above and below the average, the heaviest lens weighing more than three times the lightest, and the average weight being 212·43 mgm.; the swollen pearly-sectored cataracts were the heaviest and the over-ripe shrunken cataracts the lightest. The Indian cataracts would on the average appear to be heavier than the European. This is to be accounted for by the greater percentage of swollen cataracts met with in Indian practice.

R. H. E.

ARANA (Federico). **Cataratas Eléctricas.**—*Arch. de Oftal., Hisp.-Amer.* 1918. June. Vol. 18. No. 210. pp. 278–280.

A man received an electrical shock at a voltage of 20,000, and sustained severe damage to the arm, loin and neck. Four months later the vision began to fail very rapidly, and PACHECO LUNA, of Guatemala, found mature cataracts in both eyes and operated successfully.

R. H. E.

'IRAQ. **Annual Administration Report of the 'Iraq Health Services for the Year 1921.** [GRAHAM (J. D.), Lieut.-Col., I.M.S., Inspector-General of Health Services.]—112 pp. 1923. Baghdad: Govt. Press. [Price not stated.]

Eighty per cent. of the population of Baghdad have trachoma, 12 per cent. are blind in one eye, and 3 per cent. in both eyes; yet the leading men of the city, while much interested in the preventive work undertaken, show no inclination to help financially. Steps are being taken gradually to eliminate the hakim, but the process is slow and will take a long time. The three principal diseases are trachoma, acute contagious ophthalmia and glaucoma. The first of these is worse in the towns than in the surrounding country; the British population and the troops are remarkably free from infection. The second disease becomes epidemic in September and October, " owing to the fall of temperature allowing the gonococcus to survive on the clothes without being killed through drying." The disease is not nearly so virulent as in England. It is recommended that proclamations should be made in the mosques and synagogues early in September, drawing attention to the disease and to the dangers of delay in dealing with it. Articles in the vernacular press are also advocated. Glaucoma is very frequent and very insidious; it is said to be almost invariably accompanied by lens changes. The ophthalmic surgeon in charge is demonstrating and advocating the Elliot method of trephining among the local faculty. Uncomplicated senile cataract is stated to be an uncommon condition in this country. Myopia is extraordinarily common in Baghdad.

R. H. E.

COHEN (Louis D.). **The Practice of the Madras Ophthalmic Hospital.**—*New Zealand Med. Jl.* 1923. Feb. Vol. 22. No. 107. pp. 47–54. With 2 figs.

Cohen adds another to the list of monographs on the subject of this hospital, and is as deeply impressed as those who have preceded him with the wealth of clinical material, with the organization, and with the pervading spirit of accurate scientific work. He devotes the major part of his article to a description of the Madras technique for cataract extraction, and a careful study of this article will well repay the time given to it by any worker in the tropics. There is probably no hospital in the world where, with such enormous opportunities for clinical work, the visitor receives a more kindly welcome than that which has now for many years been extended to all who make a pilgrimage to Madras. The young ophthalmologist, who desires to get a practical mastery of his subject, and especially of the tropical branches of it, will do well to follow Mr. Cohen's example, and "stop off" at the capital of the Southern Presidency.

R. H. E.

LOUWERIER (J.). **Bijdrage tot de kennis van oogziekten in de tropen.** [Contribution to the Knowledge of Ocular Diseases in the Tropics.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 325–348.

The author gives his views on the eye diseases met with on the East Coast of Sumatra; these are generally in conformity with what has been found to hold in India. The refraction figures do not differ markedly from those derived from European experience. Conjunctival diseases, including trachoma, follow the same lines as in the rest of the East. Acquired syphilis is said to be a more common cause of parenchymatous keratitis, than is the inherited disease. Leprosy does not often show ocular manifestations. These last two statements are somewhat surprising. Cataract is common, but there are no native couchers.*

R. H. E.

FARANI (Alberto). **Occlusão intestinal verminosa.**—*Arch. Brasileiros de Med.* 1923. Aug. Vol. 13. No. 8. pp. 823–824. 1 text fig. [2 refs.]

DE MAGALHAES (P. A.). **O ensino da medicina tropical.**—*Brazil Medico.* 1923. June 23. Year 37. Vol. 1. No. 25. pp. 340–341.

---

* From a summary by Dr. W. J. BAIS.

TUBERCULOSIS.

PROCEEDINGS OF THE TRANSVAAL MINE MEDICAL OFFICERS' ASSOCIATION. 1922. Oct. Vol. 2. No. 6. pp. 1–8.—**The Disposal of Tuberculosis Cases;** and Nov. No. 7. pp. 3–5.—**Report of the Sub-Committee of the Transvaal Mine Medical Officers' Assoiaction on Tuberculosis among Mine Natives.**

Dr. HERTSLET communicated figures bearing on the numbers of natives repatriated during three alternate years.

	1916.	1918.	1920.	Total.
Tuberculosis of lungs	518	747	947	2,212
Tuberculosis and silicosis	61	97	191	349
Silicosis only	101	85	154	340

The increase in numbers he thinks to be due to more rigid methods of discovery or perhaps a higher incidence of disease. After discussing the relative hospital admissions, deaths and repatriations in East Coast and British South African natives respectively, he gives a summary of the machinery for repatriation of infected cases; stating that the system works pretty well and is, in his opinion, fairly satisfactory.

An interesting table setting forth the cost of compensation in round figures in 1917, 1919 and 1921 is as follows:—

	1917.		1919.		1921.	
	No.	Amount.	No.	Amount.	No.	Amount.
		£		£		£
Tuberculosis	950	16,000	580	14,300	540	26,000
Tuberculosis and silicosis	230	7,100	80	2,600	30	1,600
Silicosis	40	720	350	15,000	200	13,500
Ante-Primary	—	—	15	540	60	2,000
Total		£23,820		£32,440		£43,100

As the author points out, "this amount forms a rather appalling total and seems to be steadily increasing."

As to what happens to the repatriated tuberculous natives there is still room for investigation. In 1918, an enquiry carried out for Dr. WATKINS PITCHFORD on 100 cases is stated to have given results as follows: dead, 26; fit for work, 26; unfit for work, 11; not traced, 37.

It would be interesting to know how long after repatriation the "follow up" was carried out, but this is not here stated. Dr. HERTSLET suggests, as a corrective to ill-advised repatriation, "that the Bureau be authorized to divide all tuberculosis cases into three classes:—

"(*a*) Those likely to be cured by treatment within three or six months; (*b*) those who may live a year or more if sent home; and (*c*) those likely to die within a month or two.

"These to be dealt with as follows:—

"The first class to be retained for treatment. The second class to be sent home. The third class detained until their funeral."

Where the Bureau is to discover diagnosable cases of tuberculosis that can be cured by treatment within three months is a problem that puzzles the reviewer, but the point passed without comment in the discussion that followed. Dr. HERTSLET recommended that sanatoria and hospitals should be organized for the reception and the treatment of those not fit for repatriation. The whole matter, together with certain minor points that arose during the discussion, was referred to a sub-committee to report to the next meeting or as soon thereafter as possible.

At the next meeting, which was held on November 14, 1922, the sub-committee presented its report, a very important document, which should be of decided value in standardizing the work of those medical men recruiting for the mines. It would appear from this report that tuberculosis is already widely prevalent in the native territories and that, in many localities, it is slowly increasing in prevalence. With regard to disposal of cases, it is recommended that a permanent record be kept of all tuberculous natives and that they be classified and recorded by mine medical officers under the headings of " Incipient," " Moderately Advanced " and " Far Advanced," these headings being defined. The sub-committee does not consider it advisable at present to recommend the institution of sanatoria or hospitals for natives, treatment being preferably left to existing provincial or private hospitals in native territories, assisted by government grants. To guide and standardize the work of recruiting medical officers and others, the sub-committee sets forth, in a valuable schedule, the defects that should lead to rejection of applicants for employment on the mines.

Those defects that have a direct bearing on tuberculosis are as follows :—

" (1) *Weak Chest.*—Under this head are included all natives who show signs suggestive of even early tuberculosis or silicosis ; natives showing signs of pleurisy, whether acute or chronic ; chronic bronchitis, asthma, or any other lung condition which, in the opinion of the medical officer, might operate as a predisposing factor to tuberculosis. It is very important that the natives shall have good expansion, and that the lungs be clear to auscultation. If the first examination leaves any doubt in regard to the last fact, boys should be set aside for subsequent re-examination as instructed by recent circular.

" NOTE.—Natives who have rales in a circumscribed area, particularly if these are crepitant and are associated with impairment of resonance, should be rejected as being probably tubercular. Crepitations at the bases or in the nipple areas are frequent causes of rejections on the Rand, and particular attention should therefore be paid to these.

" Natives known to have been repatriated as tubercular or as having silicosis should under no circumstances be sent to the Rand.

. . . . .

" (7) *Flabby muscles and loose skin showing recent wasting.*

" NOTE.—It has been the experience that the majority of such natives develop tuberculosis and it is useless to send such men to the mines as they will invariably be rejected by the mine medical officers. But when flabbiness and loose skin are due to underfeeding, improvement may be obtained in some weeks, and, therefore, re-examination is suggested.

" (8) *Defective development.*—Long, thin, young natives, whose chests and arms are not developed in proportion to the legs, *also those who weigh less than 105 lb.*, unless under 5 ft. in height."

The sub-committee are to be congratulated on a well-considered " Schedule of Defects." To the outsider it is rather surprising to find that sanatoria and hospitals are considered inadvisable. There must be local circumstances of a peculiar nature behind what appears at first sight difficult to understand.

S. Lyle Cummins.

PROCEEDINGS OF THE TRANSVAAL MINE MEDICAL OFFICERS' ASSOCIATION. 1923. Jan.–Feb. Vol. 2. No. 9–10. pp. 2–7.—**Final Report of the Tuberculosis Sub-Committee.**

A. The sub-committee consisted of the following : Dr. J. ORENSTEIN (Chairman), Drs. S. DONALDSON, L. G. IRVINE, A. DODDS and

A. I. GIRDWOOD. Dr. P. ALLEN, Tuberculosis Officer to the Union Health Department, was present by invitation.

B. Prevalence of tuberculosis amongst the natives.—The data before the committee were insufficient to permit of definite conclusions, but it was thought safe to state that tuberculosis is widely scattered in the native territories and that, in many localities, it is slowly increasing in prevalence.

C. Initial examination of natives in the territories.—The measures now in use are broadly indicated and the committee does not feel justified in recommending the establishment of a central bureau for the examination of recruits. An amended memorandum on examination of recruits, for the guidance of practitioners in the territories, mine medical officers and the medical men examining voluntary natives and recruits of the Witwatersrand Native Labour Association, is included as an annexure to the report. This annexure may here be considered. It is couched in very general terms and is, on the whole, a good summary of how to examine native recruits. It is not, however, confined to the detection of tuberculosis but deals with all defects which are considered definite causes for rejection of applicants for employment on the mines. The first disability is Weak Chest, defined above.

A curious note under valvular lesions of the heart is to the effect that natives with tachycardia alone may be accepted. In view of the frequent association of tachycardia with early tuberculosis, this note seems unfortunate. A very wise exclusion is that under " Flabby muscles and loose skin showing recent wasting " (above). There is no better danger signal than these defects in muscle and skin tone in tuberculous natives. Due importance is given to defective development in the advice that all who weigh under 105 lbs. be rejected unless at the same time they are less than 5 feet in height. Tubercular glands in the neck are mentioned as a cause for rejection ; but there is no mention of tubercular glands elsewhere nor is it pointed out that all glandular enlargement should be regarded with suspicion as probably tubercular if not otherwise explicable. No reference is made to the significance of enlargement of the subclavicular glands, BORREL's glands, regarded by French colonial doctors as of such importance. It is probable that these recommendations, well applied by skilled and careful men, will serve to pick out a fairly high proportion of the infected natives, but it is, in our opinion, axiomatic that no really successful " tuberculosis filter " can be devised that does not include a short period of observation and the systematic recording of temperatures. If such a period could be arranged for, and if not only temperatures but tuberculin cuti-reactions were recorded, not only would the mines be saved much expense in defective labour and repatriation but South Africa would soon make an accurate contribution to the epidemiology of tuberculosis comparable to that provided by the French colonial records collected under the inspiration of CALMETTE and BORREL.

D. Steps taken for the timely detection of tuberculosis among mine native employees and recommendations in regard thereto.—The existing arrangements include periodical weighing, the examination of the lungs of all natives admitted to hospital for any cause, periodical inspection and the examination of all natives who receive an unusually large number of " loafer's tickets," *i.e.*, the " sick passes " issued to those suspended from duty but not ill enough for hospital. The committee recommends that greater care be taken in the weighing, which should be carried out by or under the supervision of a white employee ; the latter to bring to the attention of the mine medical officer any native who appears to him to be out of condition. It is further specified that all natives admitted to hospital for any cause and all who receive an unusually large number of "loafer's tickets" shall be examined *for tuberculosis.*

E. Disposal of tuberculous natives.—It is recommended that a permanent record be kept of all tuberculous natives and that they be classified under the headings of "Incipient," "Moderately Advanced" and "Far Advanced." These headings, satisfactory in themselves, are defined in the report and, it must be added, very badly defined. It is almost incredible that an attempt at the classification of tuberculosis should omit all reference to temperature, and that the only mention of tubercle bacilli in the sputum is a note that they are usually absent in incipient cases. It is disheartening to see an attempt designed to afford information about clinical type damned from the start by omission of records of fundamental importance.

The committee thinks that natives, if offered treatment locally, would refuse it, and that it is useless to attempt to retain at the mine area those found likely to die within a month. Further, it is considered inadvisable to recommend at present the institution of hospitals or sanatoria for the treatment of tuberculosis in natives; the provision of accommodation for such cases in existing provincial and private hospitals being regarded as sufficient. We look in vain for any sort of constructive proposal for the disposal of tuberculous natives, and, while admitting that local difficulties may be great, we can only regard with profound disquiet the facile suggestion to permit the return of dying cases to their kraals and the treatment of advanced phthisics in the wards of general hospitals receiving natives suffering from other diseases.

S. L. C.

LASNET. **Notes concernant l'état sanitaire des divers contingents, Européens et indigènes de l'Armée du Rhin.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.-Oct.-Nov.-Dec. Vol. 20. No. 3. pp. 273-289.

This paper is full of interest for the student of tuberculosis and, with reference to the French Army of the Rhine, affords a valuable supplement to the observations of BORREL carried out on the Senegalese and other colonial troops during the European War. It lacks, however, the post-mortem studies that are of such importance in comparing the tuberculosis of different races; a defect which is all the more to be regretted since the clinical and epidemiological notes are of the highest interest and prove that the material at the disposal of the author was of a sort to provide much valuable information.

The French Army Medical Authorities, in advance of those of most of the Great Powers in so far as concerns tuberculosis, have elaborated a fairly comprehensive scheme for dealing both with recognized and suspected cases in the Rhine Army. For the suspects there is a "Centre de Triage" at Mayence where the diagnosis can be confirmed or altered and the cases then disposed of according to a definite plan. The cases diagnosed to be suffering from tuberculosis in their own Formations are not sent to Mayence but are evacuated direct. No case of tuberculosis, except when unable to travel, is kept with the Army. European patients are evacuated to Paris, "Native" cases to Marseilles.

As noted by BORREL, the Senegalese troops are by far the most susceptible to the disease; while the Arabs, Moroccans, Annamites and Madagascar natives, though more prone to tuberculosis than Europeans, tend, nevertheless, to a clinical type comparable to that usually seen in the white races. This greater susceptibility of the Senegalese soldier as compared to the Arab is attributed to the rarity of association of the former with Europeans ; while the resemblance of clinical type noted between the Arabs and Moroccans on the one hand and European patients on the other is considered to be due to the more frequent opportunities for contact with infected persons in the French North African Colonies. How great the susceptibility of the Senegalese troops is compared to that of other races will be apparent from the following figures based on the numbers of cases diagnosed per 1,000 of effective strength during a period of twelve months :—

Europeans	9·55
Moroccans	11·73
Arabs	13·33
Annamites	15·31
Madagascar troops	13·32
Senegalese troops	83·32

An interesting table setting forth the localizations of the lesions observed according to race is here reproduced.

Tubercular Localizations.	Europeans.	Moroccans.	Arabs.	Annamites.	Malagasies.	Senegalese.	Totals.
Closed pulmonary tuberculosis	560	8	106	7	6	51	738
Open pulmonary tuberculosis	238	4	52	6	2	8	310
Tubercular bronchitis ..	98	26	156	14	14	37	345
Tubercular pleurisy ..	179	3	45	3	1	28	259
Caseous pneumonia ..	7	9	27	3	6	7	59
Miliary tuberculosis ..	1	—	—	—	—	6	7
Peritoneal tuberculosis ..	16	1	19	3	1	7	47
Tuberculosis of glands ..	29	2	11	1	3	50	96
Tuberculosis of bones and joints	11	1	8	—	2	7	29
Tubercular meningitis ..	1	—	–	—	1	—	2
Other forms of tuberculosis	7	—	3	—	—	1	11
Totals	1,147	54	427	37	36	202	1,903

The close resemblance of the types of localization in the Senegalese troops to that usually seen in infants and young children in Europe will be noticed. The interesting observation is made that the expectoration of tubercle bacilli is rare in Senegalese as compared with the other races observed ; thus confirming the findings of ROUBIER during the European War. Attention is called to the difficulties of differential diagnosis in colonial cases due to the frequency of malarial and syphilitic infections in these patients. Most of the Senegalese patients appear to have died soon after the infection had become manifest. As the author puts it : " Il est vraisemblable que bien rare ont été ceux des Sénégalais qui ont pu atteindre leur pays d'origine " ; or, again, " Chez les Sénégalais, la mortalité est encore plus elevée et bien peu, parmi ceux qui ont presenté en Europe des signes nets de tuberculose, peuvent revoir leur pays."

S. L. C.

ABBATUCCI & GRAVELLAT. **Prophylaxie de la tuberculose parmi les troupes indigènes coloniales.**—*Presse Méd.* 1923. Aug. 25. Vol. 31. No. 68. (Supplement.) pp. 1421–1424. With 1 fig. [7 refs.]

The authors deal with the steps taken to diminish the danger of tuberculosis for the Senegalese and other colonial troops sent to France for war service.

Measures taken in the Colonies.

These consisted of a severe selection of recruits; careful examination of the lungs; a period of observation in depot camps; and anti-pneumococcic inoculation before embarkation (since pneumonic infection had been found to predispose to tuberculosis).

Measures taken in France.

A period of acclimatization was arranged for the troops in special camps in the Midi and in the south-west; and it may be added that the arrival of drafts was timed to correspond with the most favourable season of the year.

Their service in the line was limited to spring and summer. For the winter, they were sent south to the temperate climate of Marseilles and its neighbourhood. Every effort was made to provide suitable clothing, food, etc.

In conformity with BORREL, the authors give the following points as of diagnostic significance during the latent infection period in the native:—

Skin dry, scaly and depigmented in places, contrasting with the soft shining skin of the healthy black; loss of flesh and of muscle tone; uncertain results of cuti-reaction; sputum usually negative for tubercle bacilli; a daily temperature—swing of from one to one and a half degrees; but few, if any, physical signs over the lungs. The "glands of BORREL," the subclavicular glands, often furnish a valuable sign, being palpable in most cases and frequently visible.

The infected black loses his natural jollity and becomes low and depressed.

The steps for the disposal of infected soldiers are described and are illustrated in a diagram which forms part of the paper. S. L. C.

MORIN (H.) & SONDAG. **Tuberculose chez le noir. Bacillémie.**—*C.R. Soc. Biol.* 1923. Apr. 21. Vol. 88. No. 13. p. 1052.

This brief note records an attempt to ascertain to what extent the progressive tuberculosis of infected Senegalese patients is of a septicaemic nature. From ten patients in the acute pyrexial stage of the disease, blood was removed by venous puncture, 5 cc. from each patient being inoculated subcutaneously into guineapigs. In only one of the ten guineapigs did tuberculosis result. This finding is taken to prove that the septicaemic appearance of infected blacks is misleading, since the proportion of infected bloods is no greater than amongst Europeans. We are inclined to think that there is here some confusion of thought. It is unlikely that tuberculous septicaemia is at all comparable to that found in the early stages of plague or typhoid, where the blood swarms with bacilli. Even in the acute types of tuberculosis there can hardly ever be this flooding of the blood-stream with germs. It is rather a case of small bacillary emboli detached into the circulation from time to time. Even when a lesion ulcerates directly into a vessel, the disease must have already lasted long enough to ensure sufficient antibodies to arrest the bacilli in the lungs, spleen, bone marrow and other organs and tissues. The finding of one positive in ten from a blood volume of only 5 cc. indicates that there is a considerable tendency to blood infection in Sengalese patients, as, indeed, in early cases in Europe.

S. L. C.

BAQUÉ (B.). **Enquête sur la tuberculose au Mzab (Sahara Algérois) étudiée par les réactions tuberculiniques.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 136–142. [3 refs.]

The inhabitants of the Mzab region are of mixed origin, chiefly Berberine, but including many other elements. Their mode of life is, for the most part, that of merchants, the children leaving their native villages early and obtaining employment in commerce in the towns of the Tell and the Hauts-Plateaux. To quote our author: " Tout Mozabite rêve d'acquérir dans le Tell la fortune qui lui permettra d'avoir une maison confortable dans sa ville natale " ; or, again, " Véritable Savoyard, il amasse dans le Nord pour dépenser chez lui." Under these circumstances it is not to be wondered at that tuberculosis is comparatively common and its infection rather widely spread. Baqué has applied the cutaneous tuberculin test to the children in several schools and reports a percentage of positives which is high in view of the early age of the subjects. The index is :—

(*a*) 34 per cent. for children of 3 to 5 years.
(*b*) 40 per cent. for children of 6 to 10 years.
(*c*) 59 per cent. for children of 11 to 15 years.

The total for all children from 3 to 15 years was 48 per cent. The proportion is about the same for each sex and there is no appreciable difference between persons of different racial stock, Mozabites, Jews, Arabs all being about the same in their percentages. In 1888 the Mzab region had the reputation of having but little tuberculosis. The last 35 years have seen a decided increase.

" L'infection a dû se faire progressivement, apportée du Tell par les commerçants mozabites."

S. L. C.

DE LANGEN (C. D.). **Tuberculosis in the Dutch Indies and in the Tropics.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. pp. 219–234. (Discussion, pp. 234–236.)

After a review of the literature of " tropical tuberculosis," de Langen proceeds to an examination of the disease as it occurs in Java. From the reports of military and civil hospitals it is made evident that tuberculosis takes the fourth place after malaria, cholera and typhoid fever, both in its morbidity and mortality. In a total of 422,943 patients, 5,492, or 1·6 per cent., suffered from tuberculosis, and of these 4,613, or 84 per cent., manifested the pulmonary form of the disease.

At the Polyclinic, de Langen found that 10–15 per cent. of the total patients seen are tuberculous, while he came across no less than four cases in a class of eighteen boys from a school under his supervision. It is clear, then, that the disease is now widely spread in at least certain parts of the country.

To obtain further light upon the problem, the author attempted, through an enquiry carried out with the help of both physicians and laymen, to get records of the distribution of the disease. While the answers show that the disease is widely spread and not limited to the dense centres of population, it is nevertheless clear that it is still very rare in the more isolated places. In one typical note it was stated that tuberculosis had only become known in the population when the area " was delivered from its isolation by a railway connection."

While some of the statistics are admittedly vague, others, founded on post-mortem investigation, are of great interest, showing, as they do, that the disease varies greatly both in clinical type and distribution in different centres. Thus HEINEMANN, working at Deli, mentions only four cases of cured apical lesions in 284 post-mortems, that is to say, only 1·4 per cent. of latent tuberculosis; while, on the other hand, he records there a tuberculosis mortality of 3·47 per 1,000 of population and notes that 59 of his 94 tuberculous patients died in the first year after the clinical appearance of the disease. Against these findings, so suggestive of the acute and unresisted clinical type associated with " virgin soil," SITZEN found, at Batavia, 47 per cent. of cases with latent tuberculosis in his post-mortems, though only 16 per cent. at Sourabaya. Similar contrasts are quoted from the records of other observers.

Hospital reports show that there is a high mortality and morbidity amongst Javanese and Chinese coolies at Deli, though these coolies are all examined before being accepted. These labourers, mostly recruited in the interior, live isolated from the Europeans on the plantations, but it would seem that their mere aggregation into large communities is sufficient to ensure the handing round of infection.

De Langen finds, in Batavia, from an investigation of some thousands of men and women, that 65 per cent. give a positive reaction with the von Pirquet tuberculin test; a result that seems to correspond well with the post-mortem findings of SITZEN; whereas HEINEMANN, examining 3,580 recently arrived coolies at Deli, found only 125, or 3·5 per cent., to give a positive cuti-reaction.

SITZEN's post-mortem findings throw much light on the clinical type of the disease in Java. Lung phenomena were found to be predominant in only half the cases, tuberculosis of lymph glands and serous membranes being very frequent. Though it is not uncommon to meet with chronic lung lesions, the acute pneumonic variety is much commoner than in Europe. The early calcification of the cartilage of the first rib, so common in chronic phthisis, is here seldom seen. Primary intestinal tuberculosis is rare, as are genito-urinary localizations, but it is common to meet with tuberculosis of the spleen, and secondary ulceration of the bowel is often met with. Bony tuberculosis appears to be very rare. In conclusion, the author quotes the observations of CUMMINS [see this *Bulletin*, Vol. 18, p. 62], with which his findings closely accord, that both the clinical type and the epidemiological distribution of the disease depend on variations of acquired resistance and infection.

S. L. C.

CUMMINS (S. Lyle). **A Lecture on the Need for Research in Framing Tuberculosis Schemes. Delivered at the Royal Institute of Public Health on Jan. 17th, 1923.**—*Lancet.* 1923. Jan. 27. pp. 165–166.

We may appropriately refer to and endorse that particular part of this lecture which draws attention to the extreme susceptibility of the native populations of the overseas dominions to tuberculous infection and emphasizes the crying need for the epidemiological investigation of tuberculosis everywhere there.

A. Alcock.

BRITISH GUIANA. **The British Guiana Society for the Prevention and Treatment of Tuberculosis. Sixteenth Annual Report of the Committee, 1922.** [GONSALVES (M.), President, & HASLAM (John F. C.), Hon. Sec.]—15 pp. 1923. Demerara: Printed by "The Argosy" Co. Ltd. [Price not stated.]

This little report contains a record of work carried out on what appear to be modern and efficient lines though greatly hampered by financial difficulties. The medical staff seems to be entirely honorary and it is therefore easy to understand how hard it is for busy men to give sufficient time to the work, most of which appears to be carried out by the health visitors so far as concerns domiciliary activity. As in the "Old Country," notification seems far from satisfactory, and the figures show that in 1921 there were 611 deaths and only 537 notifications. An improvement is to be seen in 1922, there being 527 deaths to 677 notifications; a figure not much worse than some of our own administrative areas, but still far from good, since we know from the Framingham experiment that there should be about ten notifications to one death. Some brief notes are given on the trial of garlic in tuberculosis by Dr. E. S. MASSIAH, who finds that while it may be a satisfactory palliative in lung troubles, no curative properties can be ascribed to the treatment. He thinks, however, that the remedy ought to be tried on a controlled scale in the Tuberculosis Hospital. "Hope springs eternal in the human breast." S. L. C.

FERREIRA (Clemente). **Liga Paulista contra a Tuberculose. Exercicio de 1921. Relatorio apresentado á Assembléa Geral na sessão ordinaria de 23 de Maio de 1922.**—75 pp. With 1 chart. 1922. São Paulo: Arlindo Alves.

This report embodies the work of the Model Dispensary "Clemente Ferreira" for 1921 and shows that the campaign against tuberculosis in Rio de Janeiro is an active and up-to-date organization fit to bear comparison with the best schemes of its kind in Europe.

It is clear that the Dispensary has the confidence of the public which it serves, since the cases come early for treatment—a sure index that the results are such as to inspire hope. Of 573 cases verified as tuberculosis during the year under report, the clinical types were as follows:—

Turban-Gerhardt. Stadium I	275	or 47·9 per cent.
" " Stadium II	123	" 21·4 " "
" " Stadium III	78	" 13·0 " "
Tuberculosis of glands	97	" 16·9 " "
Tuberculosis of intrathoracic glands	94	" 16·4 " "

No mention is made of surgical tuberculosis. No doubt these cases are dealt with by some other organization; but it would be of interest to know how their numbers compared with pulmonary cases. Details of the occupations of those attending the Dispensary are given and it is clear that the majority of the males affected by the disease are working men and of the females, domestic servants; but it is difficult to draw conclusions from these records without knowing the numbers of persons engaged in the various trades mentioned. It is of interest to note that no less than 57 per cent. of the cases had had influenza antecedent to their tuberculosis. Haemoptysis was an early symptom in 42 per cent., a fact which points to a fairly chronic type of phthisis such as is often met with in large cities. The author notes "the harmful influence of quitting rural surroundings and the undoubted ill-effects of industrialism with all the factors for the breaking down of resistance and the distribution of infection that it involves."

The most interesting part of the report is that in which measures of treatment are discussed ; and especially the paragraphs in which the treatment by sodium morrhuate after the manner of Sir Leonard ROGERS is described. Clinical details and progress notes of six cases treated by intramuscular injections of the morrhuate are given, in all of which some improvement was noted, while this was definite in four of the six. The injections were given two or sometimes three times a week rising from initial doses of 0·5 to 1 cc. up to 4 cc. of a 3 per cent. solution, where the treatment was well tolerated. There were no ill-effects or violent reactions, although Case 5 seems to have had increased cough after a dose of about 4 cc. given intravenously, necessitating a return to 2 cc. as the dose. The author quotes RITTER, who defines the grounds on which claims to successful treatment should be based as follows : " Als objektive Merkmale für eine Besserung kann Man immer nur Fieber, Husten und Auswurf und besonders den Bazillengehalt des Auswurfs anführen."* Ferreira claims that these points are now established for treatment by means of the morrhuate. There is also mention of the treatment of twelve cases with chaulmoogra oil ; with good results in five.

Dr. Clemente Ferreira is to be congratulated on a most interesting report.

S. L. C.

FERREIRA (Clemente). **Liga Paulista contra a Tuberculose. Exercicio de 1922. Relatorio apresentado á Assembléa Geral na sessão annual ordinaria de 28 de Maio de 1923.**—48 pp. With 1 folding chart. 1923. São Paulo : Typ. Marques, Rua das Flores, 50 a.

While this excellent report will commend itself to all those interested in tuberculosis dispensaries and their work, the exertions of Dr. Clemente Ferreira have placed the Dispensary at São Paulo on a footing equal to that of the best European organizations, and his problems are no longer those of what may be called " tropical tuberculosis." The paper contains much statistical matter comparable to that produced in the Annual Reports of Local Authorities in this country, and these tables may be commended to the attention of all those who seek comparisons between the morbidities and mortalities of tuberculosis in different communities. There is a brief mention of the results of the morrhuate of soda treatment of ROGERS, which requires to be quoted. The remedy was tried, during 1922, in 33 cases ; 26 of these being patients with tubercle bacilli in the sputum and rather extensive lesions. In two, there was disappearance of the bacilli from the sputum and five showed marked improvement. Three cases gave up the treatment, nine failed to exhibit appreciable results, one stopped the course for the time being, three went abroad or into the interior without finishing the treatment and two had only recently started the morrhuate at the time of reporting. Taken altogether, there was some improvement in 41 per cent. of the cases.

S. L. C.

LEBER (A.). **Klinische Erfahrungen über Behandlung der Lungentuberkulose in den Tropen.** [Clinical Experience of the Treatment of Lung Tuberculosis in the Tropics]—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. pp. 211-218.

After a brief but interesting and capable consideration of the factors underlying the peculiarities of tropical tuberculosis, Leber passes on to the treatment of the disease. He discusses the use of adrenalin, which he has satisfied himself to be of considerable value in tuberculosis cases free from asthmatic tendency. He also discusses tuberculin therapy, which he claims to be of service not only in Europeans but often in natives; but concludes that dosage must be very carefully managed in tropical climates, he himself having observed strong local and general reactions after the subcutaneous inoculation of one ten-millionth of a cubic centimetre of "old tuberculin." Nor is the treatment likely, in his opinion, to lead to final cure. "Wir werden mit dem Tuberkulin die Anregung zur Heilung, nicht aber die Heilung selbst erzielen."*

---

* The only objective indications of improvement are in fever, cough, and expectoration, especially its bacillus content.

From this rather pessimistic conclusion, Leber passes on to the use of sodium morrhuate (ROGERS) and at once his optimism revives. For this preparation he claims excellent results, both when used alone, and, even more so, when combined with adrenalin and other treatments of election. The beneficial effects are noted after the first injection, possibly to some extent an instance of suggestion, but accompanied by definite phenomena, such as the rapid diminution of the volume of sputum, a diminution of the number of bacilli therein, a gain in weight and a disappearance of the toxicity of the patient. Results similar to these, obtained by SCHUT at the Ngadiwono Sanatorium, are quoted. The author does not give particulars of individual cases nor the numbers treated, but he is clearly much struck with the utility of this form of treatment. S. L. C.

FERREIRA (Clemente). **Ensaios clinicos de chimiotaxia anti-tuberculosa.**—*Bol. Acad. Nac. Med.* Rio de Janeiro. 1920. Nov. 18. Vol. 91. No. 30. pp. 802–810.

After a review of previous attempts at chemotherapy in tuberculosis, the author quotes the publication by Sir Leonard ROGERS in the *British Medical Journal* of February 8, 1920, p. 142, in which were communicated the early results of the use of sodium morrhuate in the treatment of tuberculosis and leprosy. The work of MUIR and of GANGULI and others in India is also quoted, after which the author proceeds to give details of four cases treated by him with this remedy. The preparation was given in the form of a 3 per cent. solution injected intramuscularly and in some instances intravenously in doses rising from 0·5 or 1 cc. to 3 or 4 cc. The cases were of a more or less chronic type, with the exception of one patient suffering from acute febrile phthisis. The results were on the whole decidedly encouraging, the weight rising, cough and sputum diminishing, while the bacilli became fewer or could no longer be found in the sputum. The acute progressive case seemed to be less favourable than the others and the treatment, in this patient, was not persisted in.

The author, impressed with the results of preliminary trials with sodium morrhuate, expresses his desire to go further with this treatment and to apply it in a larger series of cases. S. L. C.

ROW (R.). **Some Observations on Tubercle Bacilli in Culture with Special Reference to the Properties of an Endolipase.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 692–697. With 2 figs.

In view of the work of KENDALL, DAY and WALKER, who demonstrated that a soluble lipase was liberated during the growth of tubercle and other acid-fast bacilli in fluid media, Lieut.-Col. Row, I.M.S., decided to ascertain whether any fat-splitting ferment was demonstrable in masses of tubercle bacilli grown on *solid* media rich in fatty material.

---

* With tuberculin we get the stimulus to cure, but not the cure itself.

To this end, massive growths on glycerinated brain agar were emulsified in citrated saline and divided into two equal portions, each in a separate tube. Of these, one tube was boiled to kill the bacilli and also any ferment present, after which 10 drops of toluene were added to 15 cc. of bacterial suspension; while the other, left unboiled, was treated with 10 drops of toluene also in order to kill the bacilli without injuring the ferment. After a thorough shaking, these tubes were set aside for re-examination at the end of a week or ten days. It was found that, in the unboiled tube, a definite degree of acidity had been produced by the end of this period; and the observation was confirmed by subsequent experiments. At the author's request, Major H. S. HUTCHISON, I.M.S., carried out estimations of the degree of acidity in such preparations and "controls" with the results shown in the following table.

Tube.	Contents.	C.C.n /100, Na OH required to neutralize.
1	T.B. 2 tubes + 5 drops Toluene + 0·25 cc. Ethyl Butyrate	41·2
2	T.B. 2 tubes + 5 drops Toluene + 0·25 cc. Ethyl Butyrate (boiled)	1·4
3	10 cc. citrated saline + 5 drops Toluene + 0·25 cc. Ethyl Butyrate	0·8
4	T.B. 2 tubes + 5 drops Toluene + 0·25 cc. Methyl Butyrate	30·8
5	T.B. 2 tubes + 5 drops Toluene + 0·25 cc. Methyl Butyrate (boiled)	3·7
6	10 cc. citrated saline + 5 drops Toluene + 0·25 cc. Methyl Butyrate..	3·5

Following up these observations, the author was able to demonstrate that the acid liberated by the ferment (lipase) is capable of extraction with the help of fat solvents, the best for the purpose being petroleum ether. "This extract can be easily filtered through Pasteur-Chamberlain bougies under low pressure without much loss and freed from tubercle bacilli"; and the resulting mixture of fatty acids forms with sodium a series of salts which are fairly soluble in water.

It is clear that Colonel Row has opened up problems of much importance and further communications will be awaited with interest.

S. L. C.

NAINSOUTA. **Sur un cas de tuberculose observé chez un Zébu aux Abattoirs de la Ville de Dakar.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. pp. 868–870.

This short paper records the finding of a tuberculous lesion in a bronchial gland of a zebu slaughtered in the town abattoir, the nature of which was confirmed by microscopical examination. The author, in mentioning two recent findings of tuberculosis in cattle at Dakar by CURASSON in 1920 and by TEPPAZ in 1921 [see this *Bulletin*, Vol. 20, p. 187], states that it is the first instance that has come to his personal notice in the course of thousands of systematic examinations carried out both at Dakar and at St. Louis.

He mentions that, where the calf, for any reason, cannot be fed from the mother, native herdsmen have the custom of filling their mouths with milk and expelling it into the muzzles of the calves; and he suggests that, in this way, tuberculous infection might possibly be spread. He was unable to put the bacillary strain through the tests to distinguish whether it was of bovine type; but he thinks that, as in the cases recorded by CURASSON and TEPPAZ, it was probably human.

S. L. C.

CUNNINGHAM (R. A.). **Kenya Colony and the Climatic Treatment of Tuberculosis.** [Correspondence.]—*Lancet.* 1922. May 6. p. 916.

FORNARA. **Note sur un cas de méningite tuberculeuse de la base chez un Noir, avec formation d'un tubercle dans le cervelet.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 137–139.

LASNET & TRABAUD. **Fréquence et evolution de la tuberculose parmi les divers contingents de l'armée du Rhin.**—*Congrès de la Santé Publique et de la Prévoyance Sociale. Marseille,* 11–17 *Septembre,* 1922. *Comptes Rendus.* pp. 121–128.

ROGERS (Leonard). **The Application to Tuberculosis of the Successful Treatment of Leprosy by Soluble Preparations of Chaulmoogra, Cod Liver, and other Oils.**—*Brit. Jl. Tuberculosis.* 1922. July. Vol. 16. No. 3. pp. 110–115.

AMOEBIASIS.

With reference to reviews of papers by KOFOID and SWEZY on Amoebiasis of the Bones, and Mitosis in *Endamoeba dysenteriae* in the Bone Marrow in Arthritis Deformans, Dr. Charles A. KOFOID writes as follows:—

" In the review of our article on ' Amoebiasis of the Bones ' in volume 19, p. 684, the reviewer, P. H.-M-B., states ' In the " amebas " of the intestinal tract the number of chromosomes is eight, in *Endameba coli* it is six.' The context is such that the reader might be led to infer that we had written that the number of chromosomes in *Endamoeba dysenteriae* was eight, since it was this amoeba whose cysts we found in stools in certain individuals with arthritis deformans and with Hodgkin's disease. Our findings are clearly stated in our paper, to wit, that ' we have found that the number of chromosomes in *E. coli* is six, and in *C.* [*ouncilmania*] *lafleuri* is eight. The number of these structures in *E. dysenteriae* is as yet not definitely known to us, but we have sufficient data to indicate definitely that the number is small and probably not more than six.'

" The spelling of ' ameba ' and of its derivatives which the reviewer punctiliously encloses in quotation marks is editorial, not that of the authors.

" The same reviewer in later comment [*Trop. Dis. Bull.*, Vol. 20, p. 713] on our papers on the same subjects in the University of California Publications in Zoology vol. 20, says, ' The exact species may be *Councilmania lafleuri* [but see this *Bulletin*, Vol. 19, p. 20].' We desire to direct attention to the fact that this is not our conclusion though it might appear so to the reader of the review. We explicitly state the contrary—(p. 306)—that ' it can not be *Councilmania lafleuri,* which has eight chromosomes,' etc.

" To sum up, we present evidence based on chromosome count that the structures we have interpreted (1922) as amoebae in bone marrow and lymph glands are *Endamoeba dysenteriae,* with approximately six chromosomes. They cannot be *C. lafleuri* which has eight. *E. coli* has six (*fide* Swezy, 1922). Their nuclear structure is that of *E. dysenteriae,* not that of *E. coli.*"

Charles A. Kofoid.

REVIEWS AND NOTICES.

MEDICAL RESEARCH COUNCIL. (Privy Council.) Special Report Series. No. 79. **Bacteriological and Clinical Observations on Pneumonia and Empyemata, with Special Reference to the Pneumococcus and to Serum Treatment.** By GLYNN (Ernest E.) [M.A., M.D.Cantab., F.R.C.P., Prof. of Pathology, Univ. of Liverpool], and DIGBY (Lettice) [F.R.M.S.], assisted by JONES (H. Wallace) [M.D.]—167 pp. With 12 figs. 1923. London: H.M. Stationery Office. [Price 5s. net.]

Pneumonia is responsible for more deaths than phthisis. This fact, perhaps not very widely appreciated, renders accurate knowledge of the etiology, pathology and treatment of pneumonia a question of paramount importance. It is impossible, however, in the space of a short review to give more than an outline of the information which the present publication contains on these subjects.

After a brief introduction the question of laboratory technique is very fully dealt with. There is nothing particularly new or revolutionary here, but the authors insist on the importance of receiving the material soon after collection—a point which is far from being generally appreciated—and the use of lung puncture, a procedure without danger which has given valuable information in their hands.

The next twenty pages are devoted to the isolation and identification of the pneumococcus. Mouse inoculation is the method of choice for its isolation from sputum, though of little or no value for other organisms met with in pneumonia, and in the opinion of the authors bile solubility is the most valuable test for differentiating the pneumococcus from streptococci. Naturally the final identification of the pneumococcus rests on agglutination with the type sera. Other organisms isolated from pneumonic sputa included streptococci, staphylococci, various Gram-negative cocci, the influenza bacillus and Gram-negative bacilli of the colon group, but, with the possible exception of some of the latter, the presence of these secondary infections seemed to have little bearing on the final issue.

From the valuable chapter dealing with the flora of normal sputum it would appear that this differs from that of pneumonic sputum in the smaller number of organisms present, their greater variety, the greater incidence of streptococci and the relative infrequence of pneumococci and Gram-negative bacilli.

With regard to the epidemiology and mortality of pneumococcal pneumonia, the authors' findings corroborate recent work in the United States and this country. Of 140 cases examined (112 lobar and 28 broncho-) 127, or 90·7 per cent., were pneumococcal, and of these 105, or 82·7 per cent., were lobar pneumonia. The figures for type incidence and mortality correspond closely with those of previous British workers. Types I and II were responsible for the bulk of the cases of lobar pneumonia, and the low incidence of Type III in this country was confirmed. The authors estimate that in 1919 the Type I pneumococcus alone was the cause of 8,000 deaths—twice the number of deaths from diphtheria—and on these grounds and on the grounds of the " fixity " of this type of pneumococcus they put forward a plea for a more extensive trial of Type I antiserum, the therapeutic value of which has been demonstrated by the researches of the Rockefeller Institute. In broncho-pneumonia the highest incidence by far belongs to Group IV pneumococci, and here it is interesting to note the great difference in mortality between Group IV lobar pneumonia and broncho-pneumonia, it being considerably higher in the latter condition. The reverse of this is found in Type I cases.

Following chapters deal with non-pneumococcal pneumonias, the bacteriology of empyema, the source and pathogenicity of organisms in pneumonic sputum and the correlation between the clinical history and the bacteriology of pneumococcal and streptococcal pneumonias and empyemata. There seems to be some hope of being able eventually to differentiate, on clinical grounds alone, between a streptococcal or Group IV infection and a Type I infection.

This report is of value not only for the authors' own observations, but also as a *mise au point* on this important subject.

S. Phillips Bedson.

FLETCHER (William). [M.D. Camb., Bacteriologist, Inst. for Med. Res., Kuala Lumpur.] **Notes on the Treatment of Malaria with the Alkaloids of Cinchona.**—*Studies from the Inst. for Med. Res. Kuala Lumpur Federated Malay States. No. 18.*—pp. viii+92. With 7 figs. 1923. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W.1. [Price 6*s.* net.]

Some of this book's contents (cinchona febrifuge, intramuscular and rectal quinine medication) have been elsewhere abstracted. It remains to consider the rest. Quinine sulphate, cinchonidine sulphate, quinidine sulphate and cinchonine alkaloid given in doses of ten grains daily to persons of about 100 lb. were almost equally effective in suppressing parasites. In smaller doses the second and fourth were less effective than the others. In quartan malaria the sulphate of quinidine was somewhat more active than that of quinine. Quinine alkaloid and euquinine were valuable, quinoidine, quinine tannate and quinine dicarbonate not so. For disinfestation the recommendation is for 20 grains of quinine sulphate daily continued for at least four weeks, in Fletcher's experience the limit of voluntary endurance.

The arresting feature of the book is the evidence offered regarding quinine resistance, as checked by that of quinine excretion. Of 233 patients supposed to be taking quinine in various hospitals of the Federated Malay States, in some 25 per cent., including one in which the dosage prescribed was 120 grains daily for eight days, Mayer's reagent detected none in the urine. The outcry against quinine as ineffective to cure has latterly been bitter. The failure is susceptible of four explanations—(1) There was a new war parasite, a suggestion without slightest morphological grounds; (2) The establishment of quinine resistance, for which no real evidence exists; (3) Gastrointestinal disease causes non-absorption, a matter contrary to evidence; (4) The quinine is not swallowed. During 1918 Fletcher saw at the University War Hospital many men with sheaves of documents reporting long and ineffectual treatment with quinine, ideal cases for his purpose. After obtaining a blood smear, Fletcher satisfied himself by personal examination that each of these men swallowed twice a day 10 grains of sulphate of quinine in solution. His search for a quinine-fast case ended in disappointment. The supposed resistance vanished. His only experience of real quinine resistance, and that partial, is the solitary case mentioned in this *Bulletin*, vol. 20, p. 301, a significant fact seeing his prolonged and careful search for such a condition.

The book ends by reminding us that there's many a slip twixt the cup and the lip; as it begins by quoting LEONARDO DA VINCI, "God dost give unto us all good things at the price of labour." Fletcher has paid the price.

Clayton Lane.

MARTIN (Hugh) [M.A.] & WEIR (H. H.) [M.A., M.B.] [Edited by.] With Introduction by PAGET (Stephen) [F.R.C.S.]—**Medical Practice in Africa and the East. Being a Series of Open Letters on Professional Subjects from Doctors practising Abroad, addressed to their Colleagues at Home.**—pp. x + 111. 1923. London: Student Christian Movement, 32, Russell Square, W.C. 1. [Price 4*s.* net. In paper 2*s.* 6*d.* net.]

As the writer of the introduction is quick to notice, this book "has been published under a title which rather conceals than displays the universal interest of the letters." These letters, ten in number, describe well the life and work of the surgeon and sanitarian among millions of poor and ignorant folk, sufferers from endless forms of disease, to be found in that vast area here called "Africa and the East." They tell also of personal pride in good work, of gratitude for good done to the body leading to a readiness to listen to the Christian missionary's message, which might not be so willingly yielded except under the influence of the benefits received. As recorded in the opening letter by Dr. H. T. HOLLAND, C.M.S. Hospital, Kashmir: "Here [Shikarpur], where other efforts had signally failed, an opening for missionary work was made by the point of a cataract knife, as the late Dr. A. NEVE once so well expressed it."

Turning to purely medical and surgical results as recorded by the various writers, these letters will reveal to the student and doctor at home the vast opportunities which lie to hand for operative surgery, especially operations for cataract and stone in the bladder. It is hardly an exaggeration to write that many a medical missionary anywhere in the tropics and many a civil surgeon in India may perform as many major operations in a year as would fall to the lot of an English surgeon in a lifetime.

The physician and sanitarian have a more difficult task, as all know who work in tropic lands. There is still plenty of room for those skilled in obstetrics and especially for women doctors so skilled, in India.

The style of the letters is easy and interesting; the print is good and the book is cheap!

J. H. Tull Walsh.

MACPHERSON (W. G.) [K.C.M.G., C.B.], LEISHMAN (W. B.) [K.C.M.G., C.B., F.R.S.] & CUMMINS (S. L.) [C.B., C.M.G.] [Edited by]. **History of the Great War, based on Official Documents. Medical Services—Pathology.**—pp. vi+600. With 2 plates and various figs. and charts. 1923. London: H.M. Stationery Office. [Price £1 1s.]

The well printed and admirably edited volume of the *History of the Great War* devoted to pathology, contains 33 articles with their selected bibliographies, but reference will be made here to only those specially interesting to readers of the *Bulletin*. In the account of the organization of the Pathological Service a just tribute is paid to the help afforded by the Medical Research Council (then Committee), for example, the training of protozoologists under Professor C. DOBELL, who, with Colonel D. HARVEY, contributes the chapter on amoebic dysentery. This well illustrated article points out that most of the cases regarded as mixed dysentery from Gallipoli were examples of true paratyphoid or bacillary dysentery; that the majority of those infected with *Entamoeba histolytica* were carriers of that parasite, and that a considerable proportion of the entire population of the globe, possibly 10 per cent., are healthy carriers of *Entamoeba histolytica*; in fact, investigation showed that the percentage of infection was approximately the same in dysenteric patients and in those invalided home for other causes. The failure of the routine of three negative examinations and of hypodermic injections of emetine was a striking observation. The conclusion is reached that the detection, segregation, and treatment of amoebic carriers are from a military point of view inexpedient, and that the geographical distribution of the parasite is co-extensive with that of man. The numerous investigations made during the war have shown that there are at least five species of amoeba found in the human intestine. Sir F. W. ANDREWES describes the extensive studies of all types of the *Bacillus dysenteriae* undertaken during the war and shows reason for suspecting that lactose-fermenting strains may, contrary to the general opinion of British bacteriologists, be pathogenic. Both in bacillary dysentery and in the enteric fevers the pronounced intermittence of the carrier state constituted a difficulty in connexion with the drafting regulations.

In dealing with the Enteric Fevers, Lieutenant-General Sir W. LEISHMAN says that as the existence of a third species of the paratyphoid bacillus was not fully recognized till after the war no statistics of cases appear under the heading of paratyphoid C., and that the conditions at Gallipoli much interfered with an accurate bacteriological diagnosis. But since the war a quadruple vaccine has been prepared at Millbank and employed in some parts of the Middle East garrisoned by British troops. *Bacillus paratyphosus C.* or *Bacillus paratyphosus B type Hirschfeld* is also referred to by Dr. LEDINGHAM in his article on war diarrhoea, in which he discusses the presence of *Entamoeba histolytica, B. dysenteriae* and other organisms in diarrhoea without blood or mucus. Colonel Andrew BALFOUR's description of the work done on typhus fever during the war shows the great light that has been thrown on this disease, and in discussing its etiology refers to TODD and WOLBACH's work (published in 1922) bringing additional evidence in favour of the causal rôle of *Rickettsia prowazeki.* Dr. Merwyn GORDON appropriately writes on cerebrospinal fever, and after summarizing the state of knowledge of its pathology at the beginning of 1915, proceeds to describe the researches carried out during the war; of the four types the most pathogenic was found to be type I whereas the therapeutic effect of the corresponding serum was the most satisfactory; the results with type II serum were disappointing, and further definition of this complex type is desirable.

Dr. J. W. McNEE suggests that trench fever may possibly have been a little-known tropical or sub-tropical disease introduced into Flanders by contingents from such countries. It is pointed out how the disease gradually became more severe from the time of its first appearance when splenic enlargement and the long or relapsing form were not observed. The conclusions of the British and of the American Commissions as to the infectivity of the various constituents of the blood and as to the mechanism by which lice spread the disease are given and there is a clear but cautious summary of existing knowledge of this disease. Dr. J. G. ADAMI is firmly of opinion that Pfeiffer's bacillus is primarily responsible for influenza, and suggests as a remote possibility that in the later phase of a pandemic there may be a phenomenon similar to paraagglutination, viz., that non-pathogenic micro-organisms living in the body in association with organisms producing agglutinins eventually themselves are agglutinated by relatively high dilutions of the serum of the specifically infected animal; thus streptococci living in body fluids containing the influenzal toxins may take up and eventually elaborate these toxins, and in their growth within the body produce lesions of influenza. In Professor Adrian STOKE's well illustrated article on spirochaetal jaundice, Noguchi's term *Leptospira icterohaemorrhagiae* is adopted as its morphology warrants a separate class from the spirochaetes. Of the three epidemics of jaundice in the British army that in Gallipoli was not leptospiral, while those on the Ypres front and that in Italy were due to this infection. Although the life history of the leptospira has not been fully worked out, there is some evidence, such as the filtrable nature of the organism while the filtrate, though free from leptospirae, shows by culture and animal inoculations that the virus has passed the filter, that it has a granular stage; further, cultures and sometimes animal tissues are found to contain granules of a suggestive nature. Professor STOKES failed to infect animals with blood taken during a relapse, and it may be added that this observation fits in with the view that the relapses are not due to a revival of the infection, but to liberation of toxins from destruction of the leptospirae.

Humphry Rolleston.

Corrigendum.

Vol. 20, p. 820, line 25, *for* "sea-anemones and medusae living in salt water" *read* "sea-anemones and medusae living in fresh water."

INDEX TO AUTHORS.

The bracketed abbreviations after the page numbers indicate the subject. Page numbers within brackets indicate papers not summarized.

Am.	signifies	Amoebiasis and Amoebic Dysentery.
Avit.	,,	Avitaminoses.
Bb.	,,	Beriberi.
Bl.	,,	Blackwater.
B.R.	,,	Book Review.
Chl.	,,	Cholera.
Der.	,,	Tropical Dermatology.
Dys.	,,	Dysentery (Bacillary and Unclassed).
Ent.	,,	Enteric Fevers.
Fev.	,,	Fevers.
Hel.	,,	Helminthiasis.
H.S.	,,	Heat Stroke.
Jaun.	,,	Infectious Jaundice.
K.A.	,,	Kala Azar.
Lab.	,,	Laboratory Methods.
Lep.	signifies	Leprosy.
Mal.	,,	Malaria.
Misc.	,,	Miscellaneous.
Oph.	,,	Tropical Ophthalmology.
Pel.	,,	Pellagra.
Pl.	,,	Plague.
R.F.	,,	Relapsing Fever and Other Spirochaetoses.
Sc.	,,	Scurvy.
Sp.	,,	Sprue.
S.S.	,,	Sleeping Sickness.
Tb.	,,	Tuberculosis.
Und.	,,	Undulant Fever.
Ys.	,,	Yaws.
Y.F.	,,	Yellow Fever.
Z.	,,	Medical Zoology.

A

Abadie, C., 982 (Oph.)
Abbatucci, S. & C., 977 (Mal.)
——, with Gouzien, 484 (Lep.)
——, & Gravellat, 995 (Tb.)
Abe, B., Fukui, S. & Imai, I., 763 (Misc.)
Abrami, with Joltrain & Widal, (520) (Misc.)
Abrassart, M., 59 (Misc.)
Acar, M., 745 (Pl.)
Accra, 18 (Misc.)
Ackert, J. E., with Cort, Augustine, Payne, F. K. & Payne, G. C., 240 (Hel.)
——, Payne, F. K., Stoll, N. R., & Augustine, D. L., 949 (Hel.)
Aconcha, L. E S., 648 (Misc.)
Acton, H. W., 46, 57, 664, 927 (Misc.)
——; & Chopra, R. N., 645 (Misc.)
——, ——, & Boyd, T. C., 410 (Dys.)
——, with Harvey, 32 (Misc.)
——, & King, H., 59 (Misc.)
——, with Knowles & Gupta, 965 (Mal.)
Adie, H. A., 104 (K.A.)
Adler, S., 588 (Mal.)
——, with Yorke, (165) (Lep.)
Admiralty, 932 (B.R.)
Affre, with Garin, 976 (Mal.)
Africa, C., with Monserrat, 947 (Hel.)
Agcaoili, F., with Wells & Feliciano, 429 (Misc.)
Aievoli, E., 238 (Hel.), 553, 977 (Mal.)
Akamatsu, M., 63 (Misc.)
Alalou, M., 372 (Chl.)
——, with Delamare, 880 (R.F.), 908 (Misc.)
——, with Noury, 738 (Chl.)
Albiston, H. E., 229 (Hel.)
Alcock, A., 265 (Med. Entom.)
Aldershoff, H., 962 (Mal.)
Alessandri, C., 224 (Hel.)
Alexander, R. H., 69 (H.S.)
Alfaro, S., 976 (Mal.)
Alfonso Blanco, R., (430) (Misc.)
Alibert, J., with Sézary, 30 (Misc.)
Allain, 365 (Pl.)
Allen, A. H., 563 (Mal.)
de Almeida, Junior, T., 259 (Hel.)
——, & Pessoa, S. B., 250 (Hel.)
Alphand, 23 (Misc.)
Alport, A. C., 588 (Lab.)
Alquier, A., 193 (Tb.)
Ambrose, L., (66) (Misc.)
Amster, 788 (Z.)
Ancona, G., 473 (Z.)
Anderson, C. W., 619 (Hel.)
Anderson, C., with Gobert, 620 (Hel.)
——, with Nicolle, 573, 866 (K.A.)
Anderson, J. S., 125 (Dys.)
Anderson, L. A. P., with Howard & Simonsen, 904 (Misc.)
Anding, C. E., 879 (R.F.)
Ando, A., 627 *bis* (Hel.)
Ando, R., 209 *bis*, 210 (Hel.)

de Andrade, M., with de Mello, 137 (R.F.)
Andrews, L. A., 874 (K.A.)
Andriana, S., 495 *bis* (Lep.)
d'Anfreville de la Salle, L., 900 (Misc.)
Angola, 519 (Misc.)
Anigstein, L., 429 (Misc.), 584 (Jaun.)
Ann. de Méd. et Pharm. Coloniales, 446 (Z.)
——, Soc. Belge de Méd. Tropicale, 512 (Misc.)
Annandale, N., 420 (Z.)
——, & Sewell, R. B. S., 207 (Hel.)
Anschutz, (643) (Hel.)
Aoki, K., 117 (Dys.), 478 (Z.)
——, with Tsurumi, Hara, Sakamoto & Imai, 743 (Pl.)
Apert, E., & Broca, R., 584 (Jaun.)
Appel, F., 24, 27 (Misc.)
Aragão, H. de B., 800 (Z.)
Arana, F., 988 (Oph.)
Arce, J.,(66) (Misc.), 810, 811 *bis* (Fev.), (978) (Mal.)
Archibald, R. G., 27 (Misc.), 194 (Tb.), 378 (Und.), 486 (Lep.), 620 (Hel.), 867 (K.A.)
Archibald, R. G., with Byam, 521, 614, 769 (B.R.)
Archives des Instituts Pasteur de l'Afrique du Nord, 33 (Misc.)
Archives de Médecine et Pharmacie Navales, 421 (Z.)
Ardila Gomez, L., with Peralta, M'Acormick, Carvajal, Pradilla Gonzalez, Gomez, Valdivieso, & Serpa, 911 (Misc.)
Ardin-Delteil, Azoulay, R., & Salles, 669 (Misc.)
Arêa Leão, A. E., with Terra, Torres & da Fonseca, 278 (Der.)
Aresu, M., 562 (Mal.)
Ariazzi, A., & Pico, C. E., 159 (Lep.)
Arlo, J., 616 (Hel.)
Arloing, F., with Weill & Dufourt, 80 (Avit.)
Aron, H., 396 (Sc.)
Arrillaga, F., & Guglielmetti, J., 63 (Misc.)
Arsimoles, with Hauduroy, (732) (Dys.)
Asada, J., 237 (Hel.)
Ascoli, A. (128) (Dys.)
Ash, J. E., 726 (Dys.)
Ashe, E. O., 381 (Und.)
Asheshov, I. N., with Mitchell & Richardson, 83 (B.R.)
Ashford, B. K., 734, (735) (Sp.)
Ashworth, J. H., 451 (Z.)
Asoaka, R., 938 (Hel.)
Assam, 94 (K.A.)
d'Astros, Giraud, P., & Raybaud, J., 875 (K.A.)
Atkins, W. R. G., 795 (Z.)
Atmosoediro, M. I., 851 (Misc.)
Auden, F. T., 182 (Ys.)
Audibert, 896 (Misc.)
Augustine, D. L., with Cort, Ackert, Payne, F. K., & Payne, G. C., 240 (Hel.)
——, with Ackert, Payne & Stoll, 949 (Hel.)
Auricchio, L., 379 (Und.), 869 (K.A.)
Austen, E. E., 470 (Z.)
Awati, P. R., 95 (K.A.)
Ayyar, T. S., & Krishnan, K. V., 98 (K.A.)
Azoulay, R., with Ardin-Delteil & Salles, 669 (Misc.)

B

Bach, F. W., 787 (Z.)
——, & Kiefer, K. H., 453 (Z.)
Bachmann, A., 374 (Ent.)
Baerg, W. J., 801 (Z.)
Baermann, G., 326 (S. S.), 969 (Mal.)
Bail, O., 123 (Dys.)
Baillat, with Lefebre, (261) (Hel.)
Bais, W. J., 63 (Misc.), 256 (Hel.)
Baker, C. R., 52 (Misc.)
Baker, F. C., 207 (Hel.), 478 (Z.)
Bakker, C., with v. Dijke & Hoesen, 608 (Misc.)
Baldovino, C., 16 (Misc.)
Balfour, A., 4 (Misc.), (338) (S.S.), 454, 792 (Z.), 656 (Misc.), 803 (Und.)
Balour, M. I., 422 (Misc.)
Balteano, I., 722 (Dys.)
Bambaren, C. A., 474 (Z.)
Bana, F. D., with Powell, 881 (Fev.)
Bance, J. E., (66) (Misc.)
Banerjea, S., (430) (Misc.), 944 (Hel.)
Banerjee, D. N., & Saha, J. C., 573, 869 (K.A.)
Banerjee, H. C., 977 (Mal.)
Banerji, D. N., 97, 870 (K.A.), 371 *bis* (Chl.)
Banerji, R. N., 631 (Hel.)
——, with Megaw, 814 (Bb.)
Baqué, B., 996 (Tb.)
Barber, H. W. (165) (Lep.)
Bardier, E., & Stillmunkés, A., 477 (Z.)
Bardou, (66) (Misc.)
Bargy, M., 506, 507 (Oph.)
Barlow, C. H., 618 (Hel.)
Barnes, M. E., 259, 344 (Hel.), 793 (Z.), 846 (Misc.)
Barraud, P. J., 461 (Z.)
Barreto, A., 145 (Y.F.)
Barrett, J. W., 914 *bis* (Misc.)
Bartolotta, E., 498, 983 (Oph.)
Barykin, W., & Kritsch, N., 661 (Misc.)
Basa, J. A., with Gomes & Nicolas, 157 (Lep.)

Bass, C. C., 970 (Mal.)
Bassett-Smith, P. W., 377 (Und.), 964 (Mal.)
Bates, L. B., with St. John, 131, 132 (R.F.)
Battaglia, M., 699 (S. S.)
Baugh, W. P., (643) (Hel.)
Baujean, with Kerneis, (520) (Misc.)
Baury, A., with Leger, 43, 44 (Misc.), 291 (Mal.), 364, (365), 742 *bis*, 745 (Pl.), 615 (Hel.)
——, with Leger, & Bédier, 292, 555 (Mal.)
——, with ——, & Huchard, 426 (Misc.)
Bauvallet, 285 (Der.)
——, with Houillon, 882 (Y.F.)
Baylis, H. A., (643) (Hel.)
Beach, W. H., & O'Brien, H. R., 617 (Hel.)
Beare, F. H., 718 (Dys.)
Becher-Rudenhof, F., (643) (Hel.)
Beck, R., 356 (Bl.)
Becker, 498 (Oph.)
Becker, E. R., 867 (K.A.)
——, with Hegner, 440 (Z.)
——, with Taliaferro, (479) (Z.)
Beckwith, T. D., with Reich, 335 (S.S.)
Bédier, E., with Leger, 139 (R.F.), 297, 306, 555, 971, 976 *bis* (Mal.), 445, 446, 447 (Z.), 939 (Hel.)
——, with ——, & Baury, 292, 555 (Mal.)
——, with ——, & Pinaud, 555 (Mal.)
Beeson, B. B., 286 (Der.)
Begle, H. L., 500 (Oph.)
Béguet, M., with Sergent, Edm., Parrot, Lemaire & Vérité, 667 (Misc.)
Behdjet, H., 876 (K.A.)
Behr, C., 502 (Oph.)
Beijnen, G. J. W. K., 113 (Am.)
Bell, W. B., 455 (Z.)
Bénard, R., with Bergé, Guttmann, & Roberti, 227 (Hel.)
Benchetrit, A., 488 (Lep.)
Bengston, I. A., 918 (Misc.)
Bentmann, E., with Hiltmann, E., & Köhler, O., 897 (Misc.)
Bercovitz, N., 671 (Misc.)
Bergé, A., Bénard, R., Guttmann, R. A., & Roberti, J., 227 (Hel.)
Bergell, P., & Bonnin, L., 117 (Dys.)
Bernard, N., 894 (Misc.)
Bernard, P. N. 433 (B.R.)
Bernucci, F., 824 (Lep.)
Bertarelli, E., & Marchelli, M., (373) (Chl.)
Berthélemy & Le Bourdellès, 374 (Ent.)
Bertoye, P., with Mouriquand & Michel, 399, 819 (Sc.)
Bertrand, (978) (Mal.)
Besredka, A., 678 (Misc.)
Bessemans, A., 98 *bis* (K.A.)
Bettencourt, A., & Borges, I., 218 (Hel.)
——, ——, & de Seabra, A., 217 (Hel.)
——, & Figueira, L., 621 (Hel.)
——, & da Silva, E. P., 218 (Hel.)
Beurnier, 284 (Der.)
——, & Clapier, 181 (Ys.)
Bevis, W. M., 55 *bis* (Misc.)
Beynen, G. J. W. K., 413 (Dys.)
Bezssonoff, 398 (Sc.)
Bidault, R., 574, 876 (K.A.)
de Biehler, M., 118 (Dys.)
Bigelow, G. H., with Moss, 172 (Ys.)
Bigland, A. D., 887 (Pel.)
Biglieri, R., 631 (Hel.)
Bijlsma, U. G., 762 (Misc.)
Billiard, A., with Dévé, 226 (Hel.)
Billinghurst, W. B., 106 (Am.)
Birchett, J. A. K., with Lustberg, 77 (Pel.)
Bird, F. D., (643) (Hel.)
Birt, Ed., 405 (Am.)
Biscons, with Rouzaud & de Fossey, 848 (Misc.)
Bizard, E., & Terrien, E., 569 (K.A.)
Bjekoloff, P., & Schuhalter, W., 135 (R.F.)
Blackham, R. J., 397 (Sc.)
Blacklock, B., 630 (Hel.), 868 (K.A.)
Blanchard, M., 306 (Mal.), 353 (Bl.)
——, & Lefrou, G., 138 *bis*, 202, 878 (R.F.), 328 (S.S.), 353 (Bl.), 439 (Z.), 602, 658 (Misc.)
——, ——, & Laigret, 142, 582 (Jaun.)
Bleyer, J. C., 656 (Misc.)
Bloch, T. S., 366 (Chl.)
Bloch & Bouvelot, 162 (Lep.)
Boase, W. G., 1 (Misc.)
Bode, P., 449 (Z.)
Bodet, 796 (Z.)
Bolognesi, G., 478 (Z.)
Bolton, J. S., & McGrath, M. J., 720 (Dys.)
Bombay, 30 (Misc.), 364 (Pl.), 596 (Lab.)
Bon, G. J., 110 (Am.)
Bonavia, L. L., with Parodi, 500 (Oph.)
Bonnet, A., with Nénon, 38 (Misc.)
Bonnin, L., with Bergell, 117 (Dys.)
Bonrepeaux, 282 (Der.)
Bordas, Dubief & Tanon, 361 (Pl.)
Borges, I., with Bettencourt, 218 (Hel)
——, with ——, & de Seabra, 217 (Hel.)
Bory, L., 180 (Ys.)
Bose, I., (978) (Mal.)
Bose, S. C., with Roy, 230 (Hel.)
Botelho, R., with Kraus, 476 (Z.)
Botreau-Roussel, 34 (Misc.)
Bouffard & Girard, 374 (Ent.)
Boulay, A., 923 (Misc.)
——, & Leger, M., 492 *bis*, 493 (Lep.
Bourges, H., 12 (Misc.)

Bouron, A., with Kerrest & Gambier, 132 (R.F.)
Bouvelot with Bloch, 162 (Lep.)
Bouvier, E., 980 (Oph.)
Boyd, A. S., & Joseph, M., 65 (Misc.)
Boyd, J. E. M., 806 (Fev.)
Boyd, T. C., with Acton & Chopra, 410 (Dys.)
Boyd, W. H., with Manwaring, & Okami, 739 (Chl.)
Boyé, 314 (S.S.), 356 (Bl.)
Boyers, L. M., with Kofoid & Swezy, 713 (Am.)
Bradley, B., 13 (Misc.)
Brahmachari, U. N., 102, 568, 871, 875 (K.A.)
——, & Sen, P. B., 872 (K.A.)
Branch, S., 340 (Hel.)
Brandenburg, K., 307 (Mal.)
Brau, P., 298 (Mal.), 732 (Dys.)
Breda, A., 105 (K.A.)
Breffeil, 42 (Misc.)
Breinl, F., 119 (Dys.)
Bremer, K., 227 (Hel.)
Bressot, E., 108 (Am.)
Bridges, D., 56 (Misc.)
Briggs, L. H., 132 (R.F.), 963 (Mal.)
British Guiana, 998 (Tb.)
——, West Indian Medical Conference, 1 (Misc.)
Broca, R., with Apert, 584 (Jaun.)
Broden, (66) (Misc.)
Broden, A., 60 (Misc.), 218 *bis* (Hel.)
Broden, E., 518 (Misc.)
Brodribb, C., 846 (Misc.)
Brown, D. M., 286 (Der.)
Brown, H. C., 411 (Dys.)
——, with Henry, 782 (Z.)
——, & Stammers, G. E. F., 455 (Z.)
Bruchansky, B., (415) (Dys.)
Brug, S. L., 22 (Misc.), 929 (B.R.)
Bruhat, 385 (Fev.)
Brumpt, E., (66) (Misc.), 213 (Hel.), 262 (B.R.)
Brunet, 662 (Misc.)
Brusa, P., 905 (Misc.)
de Buen, S., 99, 568, 577 (K.A.), 754 (Misc.), 793 (Z.), 962 (Mal.)
——, with Luengo, E., 698 (S.S.)
——, with Luengo & Luengo, 99 (K.A.)
Buisson, J., 352 (B.R.)
Bull, L. B., 503 (Oph.), 807 (Fev.)
Burga, B., 247 (644) (Hel.)
Burgess, E., with Docherty, 207 (Hel.)
Burnet, E., 382, 803 (Und.)
——, with Nicolle & Conseil, 804 (Und.)
Bussy, with Rollet, 987 (Oph.)
Butler, E. J., 423 (Misc.)
Buxton, P. A., 789 (Z.)
——, & Krikorian, K. S., 212 (Hel.)
Byam & Archibald, 521, 614, 769 (B.R.)

C

Caballero, A., 792 (Z.)
Cabrera, C., & Wade, H. W., 427 (Misc.)
Caius, J. F., & Mhaskar, K. S., 253 *bis* (Hel.)
Calalb, G., with Combiesco & Magheru, 722 (Dys.)
Calamida, F., 96 (K.A.)
Calcutta School of Trop. Med., 755 (Misc.)
Calderón, V. M., 501 (Oph.), 633 (Hel.)
Calhoun, F. P., 985 (Oph.)
Calmette, A., 183 (Tb.)
Calvin, J. K., with Hess & Moore, 81 (Avit.)
Camail, des T. C., (66) (Misc.)
Cambessédès, with Tanon, 743 (Pl.)
Campana y Cassi, T., 99 (K.A.)
Campbell, A. W., with Cleland, 649 (Misc.)
Campbell, J. A., 672 (Misc.)
——, with Hill, 761 Misc.)
Cantieri, C., (978) (Mal.)
Cantlie, N., 899 (Misc.)
Capone, G., 372 (Chl.)
Cappelli, J., 833 (Lep.)
Carbonell, M. V., & Zwanck, A., 627 (Hel.)
Carini, A., 44 *bis* (Misc.)
Carneiro, A. L., 277 (Der.)
Carniol, A., 578 (R.F.)
Caronia, J., 97 (K.A.)
Carougeau, with Fontoynont, 279 (Der.), 659 (Misc.)
Carpenter, G. D. H., 794 (Z.)
Carrasco, M. C., 577 (K.A.)
Carrasquillo, H. F., 214 (Hel.)
Carrère, L., with Lisbonne, 726 (Dys.)
Carrieu, with Ducamp & Gueit, 143 (Jaun.)
Carrion, A. L., 277 (Der.)
Carter, H. R., (147) (Y.F.)
Carvajal, M., with Peralta, M'Acormick, Pradilla Gonzalez, Gomez, Valdivieso, Serpa & Ardila Gomez, 911 (Misc.)
Castagna, P., 972 (Mal.)
Castellani, A., 576, 874 (K.A.)
——, Douglas, M., & Thomson, T., 657 *bis* (Misc.)
——, & Taylor, F. E., 424, 920 (Misc.)
Castelli, G. (140) (R.F.)
Castorina, G., 100, 568 (K.A.)
de Castro, A. B., 47, 66, 660, 663, (Misc.)
Catanei, A., 878 (R.F.)
——, with Sergent, Et., 976 (Mal.)
Catanel, A., with Sergent, Et., & Foley, 560 (Mal.)
Cauchemez, L., 113 (Am.)
Cavaillon & Wibaux, 406 (Dys.)

Cawston, F. G., 30, 845 (Misc.), 112, (Am.), 165 (Lep.), 216 *bis*, 221, 621 *bis*, 623, (644), 938, 939, 940, 941 (Hel.), 472, 802 (Z.)
Cazanove, M., 900 (Misc.)
Celestino dos Santos, M., (66) (Misc.)
Cerquiera, A. de C., & de Vasconcellos A., 575 (K.A.)
Chabaud, 60 (Misc.)
Chagas, C., & Villela, E., 335 (S.S.)
Chamberlain, E. N., 742 (Pl.)
Chandler, A. C., & Rice, L., 804 (Fev.)
Chapeyrou, 682 (Misc.)
Charbonnel, M., 125 (Dys.)
Charles, E., 500 (Oph.)
Chastang, 35 (Misc.)
Chatellier, L., 180 (Ys.)
Chatterjee, G. C., 444 (Z.)
Chatterjee, H., 869 (K.A.)
Chatterji, K. K., 114 (Am.), 762 (Misc.)
Chaurand, G., & Diacono, H., 620 (Hel.)
Chawla, G. S., (746) (Pl.)
Cheinisse, L., 562, 977 (Mal.), 702 (S.S.)
Chelmonski, A., 126 *bis* (Dys.)
Chesterman, C. C., 694 (S.S.), 939 (Hel.)
Cheyne, W. H. W., 914 (Misc.)
China Medical Journal, 508 (Oph.)
Chiray, M., 901 (Misc.)
Choisser, R. M., 894 (Misc.)
Chopra, R. N., 763 (Misc.)
——, with Acton, 645 (Misc.)
——, with ——, & Boyd, 410 (Dys.)
——, & Ghosh, B. N., 668, (684) (Misc.)
——, Ghosh, S., Ghosh, B. N., & De P., 923 (Misc.)
——, & Napier, L. E., 845 (Misc.)
Choyce, C. C., 767 (B.R.)
Christeller, E., 127 (Dys.)
Christophers, S. R., 792, 793 *bis* (Z.)
——, & Harvey, W. F., 556 (Mal.)
——, with Schueffner & de Jonge, 551 (Mal.)
Christopherson, J. B., 221, 224, 940, 941, 943 (Hel.), 574 *bis* (K.A.)
——, with Semon, 104 (K.A.)
Chu, H. P., 221 (Hel.)
Chukri, H., with Delamare, 154 (Lep.)
Chun, J. W. H., 358, (365) (Pl.)
——, with Wu Lien Teh & Pollitzer, 365, (746) (Pl.)
Ciavaldini, J., 667 (Misc.)
Cifuentes Labastida, R., 246 (Hel.)
Cignolini, P., 562 (Mal.)
Cignozzi, O., 967 (Mal.)
Cilento, R. W., 799 (Z.)
Ciuca, M., 370 (Chl.)
Claassen, H. L., 288 (Der.)
Clapier, 176 (Ys.), 327 (S.S.)
——, with Beurnier, 181 *bis* (Ys.)
Clapier, P., 327 (S.S.)
Clark, T., 981 (Oph.)
Clarke, J. J., 351 (B.R.)
Cleland, J. B., 802 (Z.)
——, & Campbell, A. W., 649 (Misc.)
Cochran, S., 911 (Misc.)
Cohen, L. D., 988 (Oph.)
Cole, P., 730 (Dys.)
Coles, A. C., 346 (B.R.), 584 (Jaun.), 714 (Am.)
Collin, L., 981 (Oph.)
Colombo, F., (128) (Dys.)
Combey, J., (66) (Misc.)
Combier, V., & Murard, J., 707 (Am.)
Combiesco, D., 99 (K.A.)
——, with Dopter & Dumas, 411 (Dys.)
——, with Dumas, 122, 410 (Dys.)
——, Magheru, A., & Calalb, G., 722 (Dys.)
Comes, S., 303 (Mal.)
Concepcion, I., 672 (Misc.)
Coniglio, C., (644) (Hel.)
Connal, A., 447 (Z.), 509 (Misc.)
——, & Connal, S. L. M., (260), 632 (Hel.)
Connell, R. E. W., 355 (Bl.)
Connor, M. E., 585, 792 (Y.F.)
——, & Monroe, W. M., 586 (Y.F.), 792 (Z.)
Conseil, E., with Nicolle, 115, (415) (Dys.)
——, with ——, & Burnet, 804 (Und.)
——, with ——, & Cuénod, 979 (Oph.)
Coogle, C. P., with Maxcy, 551 (Mal.)
Cooling, L. E., 791 (Z.)
Cooper, A. T., & Vadala, A. J., 642 (Hel.)
Cooper, M. L., 597 (Lab.)
Coppin, H., 180 (Ys.), 636 (Hel.), (684) (Misc.)
Coppinger, W. V., 498 (Oph.)
Córdoba, S., (128) (Dys.)
Corlette, C. E., 918 (Misc.)
Corlett, W. T., 150 (Lep.)
Cornwall, J. W., (430) (Misc.), 474 (Z.)
——, & Lafrenais, H. M., 282 (Der.)
Cornwall, L. H., & Schmitt, G. P., 597 (Lab.)
Correa Netto, O., 830 (Lep.)
Corson, J. F., with Macfie, 945 *bis* (Hel.)
——, with Ingram, 41 (Misc.)
Cort, W. W., 220, 249, (260) (Hel.)
——, Ackert, J. E., Augustine, D. L., Payne, F. K., & Payne, G. C., 240 (Hel.)
——, & Yokogawa, S., 208 (Hel.)
Corvetto, A., 209 (Hel.), 752 (Misc.)
da Costa, A. C., & Silva, 113 (Am.)
Couba, L., 429 (Misc.)
Coulogner, (308) (Mal.)
Courmont, P., & Rochaix, A., 724 *bis* (Dys.)
Courtney, B. J., 630 (Hel.)
Couvy, L., 384 (Fev.)

Coward, K. H., with Drummond & Zilva, 763 (Misc.)
Cowdry, E. V., 789 (Z.)
Cozanet, 405 (Am.)
Cragg, F. W., 134 (R.F.), 388 (Fev.), 791, 798 (Z.)
——, & Swaminath, C. S., 798 (Z.)
Cramer, A., 222, 223 (Hel.)
Cramer, W., Drew, A. H., & Mottram, J. C., 854 (Misc.)
Crawford, J. H., 59 (Misc.)
Crichlow, N., 74 (Bl.)
Cros, L., & Frécus, F., 661 (Misc.)
Crowell, B. C., 699 (S.S.)
Cuénod, with Jamin, 290 (Der.)
——, with Nicolle & Conseil, 979 (Oph.)
——, & Solovief, P., 290 (Der.)
Cummins, S. L., 997 (Tb.)
——, with Macpherson & Leishman, 1005 (B.R.)
Cumpston, J. H. L., 13 (Misc.)
da Cunha, A. M., & Muniz, J., 444 (Z.)
Cunningham, J., (66), 893 (Misc.)
——, & Varadarajan, P. S., 865 *bis*, 872 (K.A.)
Cunningham, R. A., (1002) (Tb.)
Curasson, G., 31 (Misc.), 186, 187 (Tb.)
Curtis, W. L., & Curtis, M. E., 799 (Z.)
Cutter, R. K., 721 (Dys.)

D

van Dam, C., with Woensdregt, 965 (Mal.)
Damon, S. R., 78 (Avit.)
Daniels, C. W., 434 (B.R.)
Dargein & Plazy, 379 (Und.), 879 (R.F.)
Darling, S. T., 132 (R.F.), 248, 254 (Hel.), 551 (Mal.)
Das, P. N., 231 (Hel.)
David, 168 (B.R.)
David, J., 691 (S.S.)
Davies, A., 121 (Dys.)
Davis, C. N., 728 *bis* (Dys.)
Davis, H., 154 (Lep.)
Davis, L. C., with Kolmer & Jager, 200 (Tb.)
Davison, W. C., 714 (Dys.)
Dawson, A., & Smith, R. O. A., 516 (Misc.)
Day, H. B., 853 (Misc.)
De, M. N., 577 (K.A.)
De, P., with Chopra, Ghosh & Ghosh, 923 (Misc.)
De Eds, F., with Hanzlik, 597 (Lab.)
Dean, A. L., & Wrenshall, R., 160 (Lep.)
Defiel, F., 472 (Z.)
Dekester, M., & Martin, E., (430) (Misc.)
de la Barrera, J. M., with Kraus, 36 (Misc.)
Delamare, G., 9, 39, 757, 927 (Misc.), (373) (Chl.), 487, 834 (Lep.), 555 (Mal.)
——, & Alalou, 880 (R.F.), 908 (Misc.)
——, & Chukri, H., 154 *bis* (Lep.)
——, & Mouchet, A., 881 (Fev.)
——, & Noury, O., 42 (Misc.)
Delanoë, P., 428 (Misc.), 798 (Z.)
De la Paz, D., 957 (Hel.)
Delbreil, 960 (Mal.)
Delhaye, R., with Desoil, 466 *bis* (Z.)
del Rosario, S. V., & Lopez Rizal, L., 390 (Bb.), 736 (Chl.)
Denney, O. E., & Hopkins, R., 485 (Lep.)
——, with Kolmer, 832 (Lep.)
Denoyelle, with Ramond & Lautman, 708 (Am.)
Dentici, S., 307 (Mal.)
Dernby, K. G., & Näslund, C., 412 (Dys.)
Dershimer, F. W., 340 (Hel.)
Deschiens, R., 788 (Z.)
Desoil, P., & Delhaye, R., 466 *bis* (Z.)
Destefano, F., & Vaccarezza, R. F., 525 (B.R.)
Dévé, F., 226 *ter.*, 228 *bis* (Hel.)
——, & Billiard, A., 226 (Hel.)
——, & Payenneville, J., 227 (Hel.)
Devoto, A., with Matta, 490 (Lep.)
Devoto, L., 75 (Pel.)
Dew, H. R., 622 (Hel.)
Diacono, H., 518 (Misc.)
——, with Chaurand, 620 (Hel.)
Diamantis, 624, (957) (Hel.)
Diénot, 53 (Misc.)
Digby, L., with Glynn & Jones, 1003 (B.R.)
v. Dijke, M. J., Bakker, C., & Hoesen, H. W., 608 (Misc.)
——, & Oudendal, A. J. F., 288 (Der.)
Dimmitt, P. S., with Levy, 845 (Misc.)
Djamil, M., 851 (Misc.)
——, with De Langen, 918 (Misc.)
Djémil, S., 879 (R.F.)
Dobell, C., 447 (Z.)
Dobreitzer, I. A., 357 (Pl.)
Docherty, J. F., & Burgess, E., 207 (Hel.)
Donaldson, S., 396 (Sc.)
Donatien, A., with Parrot, 105 (K.A.)
van Dongen, A., (978) (Mal.)
Doorenbos, W. B., with Keukenschrijver, 422 (Misc.)
Dopter, C., Dumas, J., & Combiesco, 411 (Dys.)
Douglas, M., with Castellani & Thomson, 657 *bis* (Misc.)
Drew, A. H., with Cramer & Mottram, 854 (Misc.)

van Driel, B. M., 50 (Misc.), 151, 484, 486 (Lep.), 397 (Sc.)
Drummond, J. C., & Zilva, S. S., 763, (520) (Misc.)
——, & ——, with Coward, 763 (Misc.)
Duba, 977 (Mal.)
Dubief, with Bordas & Tanon, 361 (Pl.)
Dubinsky, I. A., 747 (Ent.)
Dubois, A., 517, 668, 850 (Misc.)
Dubreuilh, W., 488 (Lep.)
Ducamp, Carrieu & Gueit, 143 (Jaun.)
Duff, D., 635 (Hel.)
Duffau, H. E., 374 (Ent.)
Dufourt, A., with Weill & Arloing, 80 (Avit.)
Duke, H. L., 309, 691 (S.S.)
——, with Peacock, 42 (Misc.)
Dumas, G., & Combiesco, D., 410 (Dys.)
Dumas, J., & Combiesco, D., 122(Dys.)
——, with Dopter & Combiesco, 411 (Dys.)
Dumont, J., 126 (Dys.)
Dunbar, B. H. V., 101 (K.A.)
Dunderdale, G., 230 (Hel.)
Dunn, L. H., 461, 463, 799 (Z.), 877 (R.F.)
du Noyer, R., with Langeron, 456 (Z.)
Dupuy, (430) (Misc.)
Durante, G., & Roy, J. N., 34 (Misc.)
Dutt, M. M., 845 (Misc.)
Dutta, A. C., 101 (K.A.)
Dyer, H., with Voegtlin, Smith & Thompson, 695 (S.S.)
Dyke, H. W., & Macfarlane, N. M., 282 (Der.)

E

East Africa Protectorate, 510 (Misc.)
Eastwood, E. H., 637 (Hel.)
Eckstein, F., 305 *bis* (Mal.)
Edwards, F. W., (479), 792, 795 (Z.)
Eguchi, S., 956 (Hel.)
Egypt, 504, 505 (Oph.)
Elders, C., 416 (Sp.)
Elkington, J. S. C., 14, 915 (Misc.)
Ellis, A. G., 56 (Misc.)
Elschnig, 986 (Oph.)
Embrey, H., 609 (Misc.), 818 (Sc.), 831 (Lep.)
Emile-Weil, P., & Isch-Wall, P., 592 (Lab.)
Emily, J., 977 (Mal.)
Eschbach, H., 401 (Am.)
Escomel, E., 110, 705 (Am.), 972 (Mal.)
Esguerra, C., 481 (Lep.)
Esquier, 71, 73 (Bl.)
——, & Godillon, 73 (Bl.)
Esserteau, 421 (Z.)
Eugling, M., 383 (Fev.)
Evans, A. M., 474, 793 (Z.)
Evers, H., 64 (Misc.)

F

Fabbri, G., 294, (308) (Mal.)
Faber, H. K., & Schussler, Jr., H., 577 (K.A.)
Fabre, R., (684) (Misc.)
Faculté de Médecine de Paris, 456 (Z.)
Fairley, K. D., (260) (Hel.)
Fairley, N. H., 227 (Hel.)
Falk, J., (308) (Mal.)
Fantham, H. B., 780 *bis* (Z.)
Farah, N., 579 (R.F.), 657 (Misc.)
Farani, A., (989) (Oph.)
Far Eastern Assoc. Trop. Med., 519, 551 (Misc.)
de Faria, G., & Pacheco, G., 719 *bis* (Dys.)
Faust, E. C., 137 (R.F.), 444 (Z.), (260) *bis*, 934 (Hel.)
——, with Meleney, 623, 942 (Hel.)
Federated Malay States, 301 (Mal.), 412 (Dys.), 513 (Misc.)
Feibel, B., 787 (Z.)
Felice, D., 590 (Lab.)
Feliciano, R. T., with Wells & Agcaoili, 429 (Misc.)
Ferguson, E. W., 798, 799 (Z.)
Fernando, A. S., 424 (Misc.), 508 *bis*, 984 (Oph.)
Fernbach, H., 299 (Mal.)
Ferré, (430) (Misc.)
Ferreira, C., 200, 998, 999, 1000 (Tb.)
Ferris, G. F., 795 (Z.)
Fidao, G., 704 (Am.), 970 (Mal.)
Fiessinger, N., 401 (Am.), (684) (Misc.)
Figdor, P., 846 (Misc.)
Figueira, L., with Bettencourt, 621 (Hel.)
——, with da Silva, 603 (Misc.)
Filippella, P., 561 (Mal.)
Filippini, (957) (Hel.)
De Finis, G., 906 (Misc.)
Fiorentini, A., 971 (Mal.)
Fischer, W., 500 (Oph.), 714 (Am.)
——, with Kleine, 317, 322 (S.S.)
Fleisher, M. S., & Wachowiak, M., 921 (Misc.)
Fletcher, T. B., 796 (Z.)
Fletcher, W., 301, 970 (Mal.), 513 (Misc.), 412 (Dys.), 1004 (B.R.)
——, & Visuvalingam, S. A., 970 (Mal.)
Flu, P. C., 251 (Hel.), 725 *bis* (Dys.)
Foley, H., with Parrot, 189 *bis* (Tb.)
——, with Sergent, Edm., 133 (R.F.)
——, with ——, & Vialatte, 37 *bis* (Misc.)
——, with Sergent, Et., & Catanel, 560 (Mal.)

da Fonseca, O., with Terra, Torres, & Area Leao, 278 (Der.)
Fontoynont, 9, 10 (Misc.)
——, & Carougeau, 279 (Der.), 659 (Misc.)
——, & Salvat, P., 658 (Misc.)
——, with Salvat, 278 (Derm)
Forbes, R. P., 559 (Mal.)
Forgues, M., 659 (Misc.)
Fornara, 655 (Misc.), (1002) (Tb.)
Fornara, P., 229 (Hel.)
Forrai, E., 415 (Dys.)
Forster, A. E., 985 (Oph.)
Forsyth, W. L., 24 (Misc.)
Fossati, V., with Grapiole & Palazzo, 584 (Jaun.)
de Fossey, M., with Le Noir, 714 (Am.)
——, with Rouzaud & Biscons, 848 (Misc.)
Fourneau, E., & Navarro-Martin, A., 329 (S.S.)
Fowler, H., 161 (Lep.)
Fox, H., 105 (K.A.), 178 (Ys.)
——, & Ochs, B. F., 178 (Ys.)
Fraga, C., 389 (Bb.)
França, C., 621 (Hel.)
——, & de Mello, F., 216 (Hel.)
Franchini, G., 103 (K.A), 450 *sept*, 787 *bis* (Z.)
——, with Laveran, 787 (Z.)
——, with Roubaud, (421) (Z)
Francis, E., 43 (Misc.)
——, & others, 664 (Misc.)
Franco, E. E., 99 (K A.)
Fraser, A. H., 576 (K.A.)
Fraser, A. M., 656 (Misc.)
Frécus, F., with Cros, 661 (Misc.)
Freund, R., with Rosenthal, 337, 700 (S.S.)
Freudenthal, F., (644) (Hel.)
Frew, J., with Macgregor, 112 (Am.)
Fry, A. S., 199 (Tb.)
Fuchs, B., 239 (Hel.)
Fukuhara, Y., 411 (Dys.)
Fukui, S., with Abe & Imai, 763 (Misc.)
Fulchiero, A., 564 (Mal.)
Fülleborn, F., 219, 224, 252 (260) (Hel.), 502 (Oph.), 916 (Misc.)
Funaioli, G., 70 (H.S.)
Fusco, P., 277 (Der.)
Fusco, G., & Patane, C. G , 365, 745 (Pl.)

G

van Gaasbeek, C. B., 489 (Lep.)
Gaehlinger, 703 (Am.)
Gaehlinger, H., (128) (Dys.)
Galli-Valerio, B., 944 (Hel.)
Galmozzi, F., 400 (Am.)
Gambier, A., 292 (Mal.)
Gambier, with Kerrest & Bouron, 132 (R.F.)
Gander, G., 465 (Z.)
Ganguly, S. K., 987 (Oph.)
Garcia, F., & Guevara, R., (430) (Misc.)
Garcia de Quevedo, L., 428 (Misc.)
Gardin, C., with Guillain, 204 (Hel.)
Gardner, A. D., 409 (Dys.)
Garin, C., 554, 976 (Mal.)
——, & Affre, 976 (Mal.)
Garrison, C. W., (308) (Mal.)
Gärtner, W., 51 (Misc.)
Gastinel, P., with Teissier & Reilly, 745 *bis* (Pl.)
Gastou & Tissot, 576 (K.A.)
Gaté, J., & Papacostas, G., 99 (K.A.)
Gautier, 31, 749 (Misc.), 626 (Hel.)
Gavião Gonzaga, A., 841 (Ys.)
Gazzola, M., with Orticoni, (415) (Am.)
Gendron, G., with Renault & Monier-Vinard, 571 (K.A.)
Geneesk, Tijdschr. v. Nederl.-Indië, 631 *bis* (Hel.)
de Gennes, L., with Joltrain, 362 (Pl.)
Gérard, P., with Mouchet & van Nitsen, 667 (Misc.)
Gesteira, M., 212 (Hel.)
Ghesquière, J., 471 (Z.)
Ghetti, G., 141 (Jaun.)
Ghose, S. N., 79 (Avit.)
Ghosh, B. N., with Chopra, 668, (684) (Misc.)
——, with Chopra, Ghosh, S. & De, 923 (Misc.)
Ghosh, E., 449, (479) (Z.)
Ghosh, S., with Chopra, Ghosh, B. N , & De, 923 (Misc.)
Giblin, W. E., 29 (Misc.), 72, (Bl.)
Gibson, C. C. G., 293 (Mal.)
Giemsa, G., 590 (Lab.)
Giglioli, G., 70 (H.S.), 418 (421) (Z.)
——, with Noc, 420 (Z.)
Gildemeister, E., & Herzberg, K., 739 (Chl.)
Gill, C. A., 555 (Mal.)
Gimlette, J. D., 351 (B.R.)
Gioseffi, M., 964 (Mal.)
Girard, with Bouffard, 374 (Ent.)
Giraud, P., with d'Astros & Raybaud, 875 (K.A.)
Girbal, E., 204 (Hel.), 381 (Und.)
de Gironcoli, F., (260) (Hel.)
Giuliani, S., 745 (Pl.)
Glynn, E. E., & Digby, L. with Jones, H. W., 1003 (B.R.)
Gobert, E., 919 (Misc.)
——, & Anderson, C., 620 (Hel.)
Godillon, with Esquier, 73 (Bl.)
Godoy, A., & Pinto, C., 474 (Z.), 557 (Mal.)
Goeckel, H. J., 597 (Lab.)
Goldberger, J., 78 (Pel.)
——, with Wheelor, 77 (Pel.)

Gomes, Junior, F. S., with Gonzaga, 259 (Hel.)

Gomez, A., with Peralta, M'Acormick, Carvajal, Pradilla Gonzalez, Valdivieso, Serpa, & Ardila Gomez, 911 (Misc.)

Gomez, L., Basa, J. A., & Nicolas, C., 157 (Lep.)

——, Navarro, R., & Kapauan, A. M., 666 (Misc.)

Gonsalves, M., & Haslam, J. F. C., 998 (Tb.)

Gonzaga, A. G., 363 (Pl.)

Gonzaga, O., & Gomes, Junior, F. S., 259 (Hel.)

Gonzales, E., 49 (Misc.)

Gonzalez Martinez, I., (430) (Misc.)

Goodhart, G. W., 405 (Am.)

Goodman, H., 287 (Der.)

——, & Traub, E. F., 842 (Ys.)

Goodpasture, E. W., 739 *bis* (Chl.), 832 (Lep.), 836 (Ys.)

——, & de Leon, W., 843 (Ys.)

——, with Sellards, 836 *bis* (Ys.)

——, with ——, & de Leon, 836 (Ys.)

Goonawardena, J. A. S., 841 (Ys.)

Gordon, J., 118 (Dys.), 558 (Mal.)

Gordon, R. M., 252, 956 (Hel.), (421), 460 (Z.)

Gorodkowa, A. A., with Zlatogoroff & Karetnikowo, 717 (Dys.)

Goss, M., 367 (Chl.)

Goto, K., 805 (Fev.)

Gougerot, H. 164 (Lep.), 290 (Der.)

Gouvernement Général de l'Afrique Occidentale Française, 19 (Misc.)

Gouzien & Abbatucci, 484 (Lep.)

Gouzien, P., & others, 604 (Misc.)

Gow, A., 378 (Und.)

Grabham, M. C., (66) (Misc.)

Graham, J. D., 988 (Oph.)

Gralka, R., 818 (Sc.)

Granjux, (430) (Misc.)

Grapiole, F. L., Fossati, V., & Palazzo, R., 584 (Jaun.)

Grassi, B., 790 *ter.* (Z.)

Gravellat, with Abbatucci, 995 (Tb.)

Graves, M. L., 426 (Misc.)

Gregg, A. L., 910 (Misc.)

——, with Manson-Bahr, Low, & Pratt, 705 (Am.)

de Gregoriis, A., 202 (Tb.)

Grenada, 843 (Ys.)

Greval, S. D. S., 621 (Hel.)

Griffin, R. G., 690 (S.S.)

Gros, J., & Moreno, R., 796 (Z.)

Grossule, 51 (Misc.)

Grovas, P. P., 882 (Y.F.)

Grúsz, F., 798 (Z.)

Gueit, with Ducamp & Carrieu, 143 (Jaun.)

Guerra, A., with Hoffmann, 937 (Hel.)

Guevara, R., with Garcia, (430) (Misc.)

Guglielmetti, J., with Arrillaga, 63 (Misc.)

Guiart, J., 637 (Hel.)

Guillain, G., & Gardin, C., 204 (Hel.)

Guimarães, A., 722 (Dys.)

Guimarais, A., 663 (Misc.)

——, with de Mello, 663 (Misc.)

——, with ——, & De Sousa, 660 (Misc.)

Guillermin, with Mouchet, 581 (R.F.)

Gunasekara, S. T., with Norris, Jacocks, Winsor & Keyt, 342 (Hel.)

Gunn, J. A., & Marshall, D. G., 973 (Mal.)

Günther, B., 300 (Mal.)

Gupta, B. M., 577 (K.A.)

Gupta, B. M. D., with Knowles & Napier, 781 (Z.), 866 (K. A.)

Gupta, S. A. S. B. M. D., with Knowles & Acton, 965 (Mal.)

von Gutfeld, F., 595 (Lab.)

Gutierrez, P. D., 175 (Ys.)

Guttmann, R. A., with Bergé, Bénard & Roberti, 227 (Hel.)

Guyénot, E., Naville, A., & Ponse, K., 449 (Z.)

H

Haase, M., Hall, E. R., & Marshall, C. H., 279 (Der.)

Hacker, H. P., 457 (Z.)

Haehlinger, H., (128) (Dys.)

Hage, (644) (Hel.), 703 (Am.)

Hagen, S., 986 (Oph.)

Hajos, K., 638 (Hel.)

Hall, A. H., 939 (Hel.)

Hall, E. R., with Haase & Marshall, 279 (Der.)

Hall, M. C. ,206, 255, 935 (Hel.)

——, & Shillinger, J. E., 628 (Hel.)

Hamerton, A. E., 602 (Misc.)

Hamilton-Browne, E., 658 (Misc.)

Hampton, G. G., 256 (Hel.)

——, with Leach, 642 (Hel.)

——, with Nicholls, 256 (Hel.)

Hanel, G., 299 (Mal.)

Hanzlik, P. J., & De Eds, F., 597 (Lab.

Hara, C., with Tsurumi, Sakamoto Imai & Aoki, 743 (Pl.)

Harnett, W. L., (261) (Hel.)

Harold, C. H. H., 516 (Misc.)

Harper, P., 162, 489 (Lep.)

Harries, D. J., (66) (Misc.)

Harrison, L., 462 (Z.)

Hart, E. B., Steenbock, H., & Lepkovsky, S., 398 (Sc.)

Hartendorp, A. v. H., (520) (Misc.)

Hartmann-Keppel, G. L., 575 873, (K.A.), 927 (Misc.)

Harvard University, 8 (Misc.)

Harvey, W. F., 593, 600 *bis* (Lab.)
——, & Acton, H. W., 32 (Misc.)
——, with Christophers, 556 (Mal.)
——, & Iyengar, K. R. K., 595, 596 (Lab.)
Hashimoto, T., & Ogiwara, H., 472 (Z.)
Haslam, J. F. C., with Gonsalves, 998 (Tb.)
Hasseltine, H. E., 485 (Lep.)
Hasson, J., 164 (Lep.)
Hasui, N., 816 (Bb.)
Hata, S., 610 (Misc.)
Hatori, J., 386 (Fev.)
Hauduroy, P., 124 (Dys.)
——, & Arsimoles, (732) (Dys.)
Haughwout, F. G., 781 (Z.)
Hayshi, S., 237, 252 (Hel.)
Hayashi, T., 816 (Bb.)
Hazebroek, F. E. A., 653 (Misc.)
Heckenroth, F., 31 (Misc.), 307 (Mal.)
——, & Nogue, 280 (Der.)
Hegner, R. W., 438, 443 (Z.), 751 (Misc.), 780, 783 (Z.)
——, & Becker, E. R., 440 (Z.)
Hehir, P., 52, (66) (Misc.), 366 (Chl.)
den Heijer, J. K., (66) (Misc.)
Heinemann, H., 31, 514 (Misc.), 201 (Tb.)
Hemsen, 629 (Hel.)
Henry, 429 (Misc.)
Henry, T. A., 205 (Hel.)
——, & Brown, H. C., 782 (Z.)
D'Herelle, E., 740 (Chl.)
Hermans, E. H., 653 (Misc.)
Heron, G. W., 960 (Mal.)
Herzberg, K., with Gildemeister, 739 (Chl.)
Hess, J. H., Moore, J. J., & Calvin, J. K., 81 (Avit.)
Hesse, E., with Leger, 788 (Z.)
Hesselbach, K., 325, 702 (S.S.)
Hetherington, D. C., 628 (Hel.)
Hewetson, W. M., 758 (Misc.)
Heymann, 704 (Am.)
van Heyningen, A. K., (520) (Misc.)
Hill, L., & Campbell, J. A., 761 (Misc.)
Hiltmann, E., with Bentmann & Köhler, 897 (Misc.)
Hirai, I., 714 (Am.)
Hirai, S., 391 (Bb.)
Hirst, L. F., 359, 360 (Pl.)
Hirst, S., 473 (Z.)
Hodgson, E. C., 596 (Lab.)
Hoesen, H. W., 361 (Pl.)
——, with v. Dijke & Bakker, 608 (Misc.)
Hoffman, C. T., with Palmer, 393 (Bb)
Hoffman, F. L., 54 (Misc.), 152 (Lep.)
Hoffmann, W. H., 130 *bis* (R.F.), 147 *quat.* 586 (Y.F.), 26, 56, 666, 851 (Misc.), 219 (Hel.), (421), 471, (479) 798 (Z.)
Hoffmann, Guerra, A., 937 (Hel.)
Hogue, M. J., 441 (Z.), 579 (R.F.)
——, & van Winkle, C., 784 (Z.)
Hoki, R., with Inada, Ido, Kaneko, Ito, Wani & Okuda, (144) (Jaun.)
——, with ——, ——, Ito & Wani, (144) (Jaun.)
Holt, W. L., 805 (Fev.)
Hone, F. S., 807 *bis* (Fev.)
Honeyman, S., (430) (Misc.)
Honig, P. J. J., 685 (B.R.)
van Hoof, L., with van den Branden, 43, 45 (Misc.), 177 (Ys.), 329, 698, 702 (S.S.), 934 (Hel.), 959 (Mal.)
Hooton, A., 423, 852 (Misc.)
Hopkins, R., with Denney, 485 (Lep.)
Höppli, R., (520) (Misc.)
Hornus, P., 375 (Ent.)
Horsley, Jr., J. S., 564 (Mal.)
Horta, P., with Langeron, 280 (Der.)
Houillon & Bauvallet, 882 (Y.F.)
Houssiau, 54 (Misc.)
Howard, A., Simonsen, J. L., & Anderson, L. A. P., 904 (Misc.)
Howard, H. J., & Li, T. M., 508 (Oph.)
Huchard, G. L., 30 (Misc.)
——, with Leger, 188 (Tb.)
——, with ——, & Baury, 426 (Misc.)
——, with Noc, 186 (Tb.)
Hudellet, G., 27, 927 *bis* (Misc.), 189 (Tb.), 234 (Hel.), 289 (Der.), 506 (Oph.)
——, with Lhuerre, 654 (Misc.)
——, with Nogue & Leger, 428 (Misc.)
Hudson, N. P., 117 (Dys.)
Huizenga, L. S., 580 (R.F.)
Humphreys, L., with Hunt, 919 (Misc.)
Hunt, D., & Humphreys, L., 919 (Misc.)
——, & Johnson, A. L., 840 (Ys.), 955 (Hel.)
Huot, 749 (Misc.)
Huppenbauer, K., 712 (Am.)
Hutchison, R., 627 (Hel.)
Hutchison, H. S., with Murphy, S. J., 48 (Misc.)
Hylkema, B., 364 (Pl.)
Hyvert, R., 927 (Misc.)

I

Iacono, I., 429, (430) (Misc.), 738 (Chl.)
Ibuki, T., with Okada, Sakurai & Kabeshima, 815 (Bb.)
Ido, Y., with Inada, Kaneko, Hoki, Ito, Wani & Okuda, (144) (Jaun.)
——. with ——, Hoki, Ito & Wani, (144) (Jaun.)
Ignacio Uribe, J., 481 (Lep.)
Ihle, J. E. W., 239 (Hel.)
Ikeda, S., 209 (Hel.)
Ikuchi, K., 816 (Bb.)

Ilowaisky, S. A., 114 (Am.)
Imai, I., with Abe & Fukui, 763 (Misc.)
Imai, M., with Tsurumi, Hara, Sakamoto & Aoki, 743 (Pl.)
Inada, R., 141 (Jaun.)
——, Ido, Y., Hoki, R., Ito, H., & Wani, H., (144) (Jaun.)
——, Ido, Y., Kaneko, R., Hoki, R., Ito, H., Wani, H., & Okuda, K., (144) (Jaun.)
Inami, H., 788 (Z.)
Indian Journal of Medical Research, (261) (Hel.)
Indian Med. Gaz., 92 (K.A.)
Ingram, A., (261) (Hel.)
——, & Corson, J.F., 41 (Misc.)
——, & Macfie, J. W. S., 461 *bis* (Z.), 654 (Misc.)
——, with Macfie, 18 (Misc.), 456 (Z.)
Ingram-Johnson, R. E., 299 (Mal.)
Ioff, I., 559 *bis* (Mal.), 588 (Lab.)
——, with Kitaeff, 977 (Mal.)
——, & Rumjanzew, W., 559 (Mal.)
Iraq, 988 (Oph.)
Iriye, E., 394 (Bb.)
Iriye, H., 438 (Z.)
Isaac-Krieger, K., & Löwenberg, W., 299 (Mal.)
Isaacs, R., 226 (Hel.)
Isch-Wall, P., with Emile-Weil, 592 (Lab.)
Ishiwara, K., & Ogata, N., 809 (Fev.)
Isobé, M., 225, 943 *ter*. (Hel.)
Ito, H., with Inada, Ido, Hoki & Wani, (144) (Jaun.)
——, with ——, ——, Kaneko, Hoki, Wani & Okuda, (144) (Jaun.)
Ito, S., (165) (Lep.)
Iyengar, K. R. K., 873 (K.A.)
——, with Harvey, 595, 596 (Lab.)
Izar, G., 111, 114 (Am.)
Izawa, T., with Matsuo, 119 (Dys.)

J

Jacocks, W. P., with Norris, Winsor, Gunasekara & Keyt, 342 (Hel.)
Jager, R., with Kolmer & Davis, 200 (Tb.)
Jame, 26 (Misc.)
Jame, L., 193 (Tb.)
Jamin & Cuénod, 290 (Der.)
Jamot, E., 689 (S.S.)
Jancou, A., 847 (Misc.)
Janin, F., 480, 492 (Lep.)
Jansen, B. C. P., 814 *bis* (Bb.)
Japha, A., (261) (Hel.)
Jausion, H., 125 (Dys.)
Jegat, Y., with Lenoble, 401 (Am.)
Jalambi, R., 108 (Am.)
Jemma, R., 872, 875 (K.A.)
Jenkins, C. F., 930 (B.R.)
Jennissen, J. A. M. J., 609 (Misc.)
Jepps, M. W., 781 (Z.)
Jettmar, H. M., 358 (Pl.)
Jimbo, K., (261) (Hel.)
Joff, I., 588 (Lab.) See also under Ioff.
Joffick, S. D., 911 (Misc.)
Johnson, A. L., with Hunt, 840 (Ys.), 955 (Hel.)
Johnson, W. B., & Lloyd, L., 468, 794 (Z.)
Johnston, T. H., 462 (Z.)
Jojot, C., 316 (S.S.)
Joltrain, E., & de Gennes, L., 362 (Pl.)
——, with Abrami & Widal, (520) (Misc.)
Jones, H. W., with Glynn & Digby, 1003 (B.R.)
Jonescu, A. P., 579 (R.F.)
de Jong, D. A., 214 (Hel.)
de Jonge, with Schueffner & Christophers, 551 (Mal.)
José Quintini, M., 214 (Hel.)
Joseph, M., with Boyd, 65 (Misc.
Jouenne, 280 *quin*. (Der.)
Joukowsky, A., with Yakimoff & Schirwind, (431), 927 (Misc.)
Journal des Praticiens, 977 (Mal.)
Journal of Laboratory & Clinical Medicine, 597 (Lab.)
—— of Tropical Medicine & Hyg., 56 (Misc.)
Jouve, A., with Rolland, 79 (Avit.)
Joyeux, C., 615, 625, 957 (Hel.)
Judd, F. H., 497 (Oph.)
Jukov, N., Marzinowsky, V., & Sutchkova, O., 961 (Mal.)
Jungbluth, J., 561 (Mal.)

K

Kabeshima, H., with Okada, Sakurai & Ibuki, 815 (Bb.)
Kabeshima, T., 369 *bis*, (740) *bis* (Chl.)
Kagoshima, S., with Ogata, Kawakita, Suzuki, & Oka, 816 (Bb.)
Kaiser, L., 478 (Z.)
Kaku, T., 805 (Fev.)
Kamada, R., 617 (Hel.)
——, with Usami, 205, 237 (Hel.)
Kampman, A., (520) (Misc.)
Kanai, S., 121 (Dys.)
Kandelaki, S., 385 (Fev.)
Kaneko, R., & Okuda, K., (144) (Jaun.)
——, with Inada, Ido, Hoki, Ito, Wani & Okuda (144) (Jaun.)
Kanter, H., (260) (Hel.)
Kapauan, A. M., with Gomez & Navarro, 666 (Misc.)
Kapur, D. D., 983 (Oph.)
Karetnikowa, W. W., with Zlatogoroff & Gorodkowa, 717 (Dys.)

Kasai, K., 581 (R.F.), (732) (Dys.), 886 (Jaun.)
Katayama, T., 143 (Jaun.)
Katsunuma, S., 626 (Hel.)
Kauntze, W. H., 510 (Misc.)
Kawakami, Z., 232 (Hel.)
Kawakita, S., with Ogata, Suzuki, Kagoshima & Oka, 816 (Bb.)
Kawamura, R., 810 (Fev.)
Kayser, J. D., 31 (Misc.)
Kazama, Y., 214, 220, (644) *bis* (Hel.)
Keane, G. J., 650 (Misc.)
Kehrer, J. K. W., (520) (Misc.)
Kelly, F. L., 808 (Fev.)
Kendrick, J. F., 341 (Hel.)
Kennan, R. H., 50 (Misc.)
Kennedy, J. C., 874 (K.A.)
Keramopoulos, E., 61 (Misc.)
Kernéis, 11, 44 (Misc.)
——, & Baujean, (520) (Misc.)
—— & Morin, 74 (Bl.)
——, with Noc, 31 (Misc.)
Kerr, W. M., 608 (Misc.)
Kerrest, J., Gambier, A., & Bouron, A., 132 (R.F.)
Keukenschrijver, N. C., 936 (Hel.)
——, & Doorenbos, W. B., 422 (Misc.)
Keyser, D. L., 597 (Lab.)
Keyt, F., with Norris, Jacocks, Winsor, & Gunasekara, 342 (Hel.)
Khalil, M., 75 (Pel.), 220, 935, 937 (Hel.)
——, & Lee, C. U., 940 (Hel.)
Khan, G. P., (748) (Ent.)
Kiefer, K. H., with Bach, 453 (Z.)
Kihn, B., 392 (Bb.)
Killick, C., 986 (Oph.)
King, H., with Acton, 59 (Misc.)
Kireeff, M., 578 (R.F.)
Kirschbaum, W., 975 (Mal.)
——, with Mühlens, 295 (Mal.)
Kirschner, L., 974 *bis* (Mal.)
Kitaeff, F. J., 114 (Am.)
——, & Ioff, I., 977 (Mal.)
Kleine, F. K., 687 (S.S.)
——, & Fischer, W., 317, 322 (S.S.)
Kligler, I. J., 135 (R.F.), 933 (Hel.)
Klotz, O., & Lindenberg, H., 574 (K.A)
Knipping, H. W., 922 (Misc.)
Knowles, R., 755 (Misc.)
——, Acton, H. W., & Gupta, S.A.S.B.M.D., 965 (Mal.)
Knowles, R., Napier, L. E., & Gupta, B.M.D., 781 (Z.), 866 (K.A.)
Kobayashi, H., 937 (Hel.)
Kodama, H., & Takeda, H., 372 (Chl.)
Kofoid, C. A., 248 (Hel.)
——, Boyers, L. M., & Swezy, O., 713 (Am.)
——, Kornhauser, S. S., & Swezy, O., 592 (Lab.)
——, & Swezy, O., 713, 1002, (Am.)
Kofoid, C. A., & Tucker, J. P., 248 (Hel.)
Köhler, O., with Bentmann & Hiltmann, 897 (Misc.)
Koino, S., 235, 636 (Hel.)
Kolmer, J. A., & Denney, O. E., 832 (Lep.)
——, Davis, L. C., & Jager, R., 200 (Tb.)
Konsuloff, S., 305 (Mal.)
Ko-Ran, 369 (Chl.)
Korenchevsky, V., 815 (Bb.)
Kornhauser, S. S., with Kofoid & Swezy, 592 (Lab.)
Korns, J. H., 62 (Misc.)
Korteweg, P. C., 762 (Misc.)
Korteweg, 962 (Mal.)
de Korte, W. E., 851 (Misc.)
Korthoff, G., 852 (Misc.)
Kosaka, K., 211, 938 (Hel.)
Koshiwo, S., with Muto, 211 (Hel.)
Koskinas, G., with Sträussler, 977 (Mal.)
Kouwenaar, W., 674, 917 (Misc.), 884 (Jaun.)
Kraus, R., 8, 427 (Misc.), (376) (Ent.), 478 (Z.)
——, & de la Barrera, J. M., 36 (Misc.)
——, & Botelho, R., 476 *bis* (Z.)
Kreuser, 717 (Dys.)
Krikorian, K. S., with Buxton, 212 (Hel.)
Krishnan, K. V., with Ayyar, T. S., 98 (K.A.)
Kritsch, N., with Barykin, 661 (Misc.)
Kubo, N., 610 (Misc.)
Kuenen, W. A., 405 (Am.), 437 (Z.)
Kuhle, W., 719 (Dys.)
Kuijer, A., 22 (Misc.)
Kulescha, G. S., & Titowa, N. A., 578 (R.F.)
Kuno, Y., 683 *bis* (Misc.)
Kusumbeker, G. C., (496) (Lep.)

L

van Laaren, G. F., 293 (Mal.)
Labbé, M., 569 (K.A.)
Labernadie, V. G. F., & Peyre, E. L., 909 (Misc.)
Lachaume & Tournier, 228 (Hel.)
Lacroix, A., with Montpellier, 234, 633 (Hel.)
Lacroix, A., with Raynaud & Montpellier, 282, 285 (Der.)
Lafrenais, H. M., with Cornwall, 282 (Der.)
Lagrange, E., 618 (Hel.), 807 (Fev.)
Laigret, 633 (Hel.)
—— & Lefrou, 28 (Misc.)
Laigret, J., with Blanchard & Lefrou, 142, 582 (Jaun.)
Lake, G. C., 206 (Hel.), 380 (Und.)

Lal, R. B., 975 (Mal.)
Lama, A., 496 (Lep.)
Lambert, R. A., 577 (K.A.)
Lambert, S. M., 641 (Hel.), 733 (Sp.)
Lamborn, W. A., 470 (Z.)
Lambright, G. L., 111 (Am.)
Lampe, P. H. J., (373) (Chl.)
Lämpe, 728 (Dys.)
Lamoureux, A., 828 (Lep.)
Lamson, P. D., & McLean, A. J., 922 (Misc.)
Lancelin, R., 238 (Hel.)
Lancet, 911 (Misc.)
Landeman, E., with Muir, Roy & Santra, 826 (Lep.)
Lane, C., 208, 638, 639, 947 (Hel.), 771 (Mal.)
——, & Low, G. C., 625 (Hel.)
de Langen, C. C., 25 (Misc.)
de Langen, C. D., 151 (Lep.), 391 (Bb.), 425, 648 (Misc.), 966 (Tb.)
——, & Djamil, M., 918 (Misc.)
——, & van Loon, F. H., 388 (Fev.)
Langeron, M., 279 (Der.), 306 (Mal.), 658, 659 (Misc.)
——, & du Noyer, R., 456 (Z.)
——, & Horta, P., 280 (Der.)
Lantuéjoul, P., with Lemierre, 251 (Hel.)
Lanz, O., (261) (Hel.)
Laoh, P., 561 (Mal.)
Larde y Arthes, C. R., 793 (Z.)
Larrousse, F., 795, 800 (Z.)
Lasnet, 755 (Misc.), 993 (Tb.)
——, & Trabaud, (1002) (Tb.)
Lautman, with Ramond & Denoyelle, 708 (Am.)
Lavandero, R., 745 (Pl.)
Laveran, A., & Franchini, G., 787 (Z.)
Leach, C. N., 255 (Hel.)
——, & Hampton, G. G., 642 (Hel.)
Le Bas, G. Z. L., 215 (Hel.)
Lebedev, D., 947 (Hel.)
Leber, A., 999 (Tb.)
Le Bourdellès, 39 (Misc.)
——, with Berthélemy, 374 (Ent.)
Lecercle, (66) (Misc.)
Leclerc, H., (261) (Hel.), 828 (Lep.)
Le Comte, A., 805 (Fev.)
Le Dantec, 849 (Misc.)
Le Dantec, A., 26 (Misc.)
Ledingham, J. C. G., 665 (Misc.)
Le Dentu, R., 969 (Mal.)
Lee, C. U., with Khalil, 940 (Hel.)
Le Fanu, G. E. H., & O'Brien, A. J. R., 580 (R.F.)
Lefebvre, A., & Baillat, (261) (Hel.)
Lefrou, 693 (S.S.)
——, with Blanchard, 138 *bis*, 202, 878 (R.F.), 328 (S.S.), 353 (Bl.), 439 (Z.), 602, 658 (Misc.)
——, with ——, & Laigret, 142, 582 (Jaun.)
Lefrou, with Laigret, 28 (Misc.)
——, & Ouzilleau, F., 327, 329, 691 (S.S.)
Legendre, J., 184 (Tb.), 461 (Z.)
——, & Louis, J., 791 (Z.)
Leger, A., 788 (Z.)
Leger, L., & Hesse, E., 788 (Z.)
Leger, M., 70 (H.S.), 247, 619 (Hel.), 444, 824 (Z.), 280 (Der.), 824 (Lep.)
——, & Baury, A., 43, 44 (Misc.), 291 (Mal.), 364, (365), 742 *bis*, 745 (Pl.), 615 (Hel.)
——, & Bédier, E., 139 (R.F.), 297, 306, 971, 976 *bis* (Mal.), 445, 446, 447 (Z.), 939 (Hel.)
——, ——, & Baury, A., 292, 555 (Mal.)
——, with Boulay, 492 *bis*, 493 (Lep.)
——, & Huchard, G., 188 (Tb.)
——, ——, & Baury, A., 426 (Misc.)
——, & Lheurre, 362, 744 (Pl.)
——, & Nogue, M., (165) (Lep.), 960 (Mal.)
——, with ——, & Hudellet, 428 (Misc.)
——, & Pezet, O., 188 (Tb.)
——, Pinaud, J., & Bédier, E., 555 (Mal.)
——, with Reynaud, 619 (Hel.)
Leichtentritt, B., & Zielaskowski, M., 337 (S.S.)
Leiper, R. T., 85, 625, 857 (Hel.)
Leishman, W. B., with Macpherson & Cummins, 1005 (B.R.)
Leitao, A. do N., 609 (Misc.)
Leiva, L., 104 (K.A.)
——, with Sellards, 400, 402 (Am.)
Lejeune, E., 41 (Misc.), 74 (Bl.)
Lemaire, G., with Sergent, Edm., Béguet, Parrot, & Vérité, 667 (Misc.)
Lemierre, A., & Lantuéjoul, P., 251 (Hel.)
Lemoine, P., with Valois, 987 (Oph.)
Lenoble, E., & Jegat, Y., 401 (Am.)
Le Noir & de Fossey, M., 714 (Am.)
Leon, N., 792 (Z.)
De Leon, W., with Goodpasture, 843 (Ys.)
——, with ——, & Sellards, 836 (Ys.)
Lepkovsky, S., with Hart & Steenbock, 398 (Sc.)
Le Roy des Barres, A., 711 (Am.), 729 (Dys.)
Lessa, G., 917 (Misc.)
Levaditi, C., & Nicolau, S., 7 *quat.*, 680, 847, 910, 925 *bis* (Misc.)
Levitt, M. J., 486 (Lep.)
Levy, M. D., 653 (Misc.)
——, & Dimmitt, P. S., 845 (Misc.)
Lewis, J., 763 (Misc.)
Lhuerre, 282 (Der.), 365 (Pl.)
——, & Hudelet, G., 654 (Misc.)
——, & Leger, M., 744 (Pl.)

Lhuerre, with Leger, 362 (Pl.)
Lloyd, I. H., 806 (Fev.)
Lloyd, L., with Johnson, 468 (Z.)
Li, T. M., 981 (Oph.)
——, with Howard, 508 (Oph.)
Libby, W. E., 623 (Hel.)
Lichtenstein, A., 408, 719 (Dys.), 669 (Misc.)
Lindenberg, A., 576 (K.A.)
Lindenberg, H., with Klotz, 574 (K.A.)
Lins, A., 116, 719 (Dys.)
Lins, A. E. E., 408 (Dys.), 788 (Z.)
Liotta, D., 819 (Sc.)
de Lint, J. G., (496) (Lep.)
Lisbonne, M., & Carrère, L., 726 (Dys.)
Lister, A. E. J., 988 (Oph.)
Lister, S., 607 (Misc.)
Liston, W. G., 364 (Pl.), 596 (Lab.)
Little, E. M., 413 (Dys.)
Lloyd, I. H., 806 (Fev.)
Lloyd, L., with Johnson, 468, 794 (Z.)
Logan, A. H., 449 (Z.)
Lombardo, G., 362 (Pl.)
van Loon, F. H., 34, 601, 924 (Misc.)
——, with de Langen, 388 (Fev.)
Lopes, J. B., 217, 218 (Hel.)
Lopez-Lomba, J., 819 (Sc.)
——, & Randoin, 818, *bis* (Sc.)
Lopez Rizal, L., with del Rosario, 390 (Bb.) 736 (Chl.)
Lorentzen, W., 715 (Dys.)
Lotka, A. J., 298 *bis* (Mal.)
——, with Sharpe, 298 (Mal.)
Loughnan, W. F. M., 850 (Misc.)
Louis, J., with Legendre, 791 (Z.)
Louwerier, J., 989 (Oph.)
Low, C. W., (66) (Misc.)
Low, G. C., 902 (Misc.)
——, with Lane, 625 (Hel.)
——, & Manson-Bahr, P., 323 (S.S.)
——, & ——, with others, 702 (S.S.)
——, with ——, Pratt & Gregg, 705 (Am.)
Low, G. C., & Newham, H. B. G., 499 (Oph.)
Löwenberg, W., with Isaac-Krieger, 299 (Mal.)
Ludlow, A. I., 706 (Am.)
Luengo, E., & de Buen, S., 698 (S.S.)
——, with Luengo & de Buen, 99 (K.A.)
Luengo, P., de Buen, S. & Luengo, E., 99 (K.A.)
Lundsgaard, K. K. K., 628 (Hel.)
Lustberg, S. R., & Birchett, J. A. K., 77 (Pel.)
Lynch, K. M., 287 (Der.), 441, 454, 788 (Z.)
Lyon, Jr., M. W., 590 (Lab.)
Lyon, M. W., & Trager, V. B., 597 (Lab.)

M

M'Acormick, D. D., with Peralta, Carvajal, Pradilla Gonzalez, Gomez, Valdivieso, Serpa & Ardilla Gomez, 911 (Misc.)
MacCallan, A. F., 504, 505 (Oph.)
MacCallum, W. G., & Oppenheimer, E. H., 847 (Misc.)
McCartney, J. E., & Olitsky, P. K., 723 (Dys.)
McCollum, E. V., with Shipley & Simmonds, 394 (Bb.)
——, & Simmonds, N., 81 (Avit.)
McConnell, G., 564 (Mal.)
McConnell, R. L., 904 (Misc.)
McConnel, S. V., with Tebbutt, (431) (Misc.)
McCoy, G. W., 365 (Pl.)
McDonagh, J. E. R., 624 (Hel.)
McDonald, J. D., 788 (Z.)
McDonald, W. M., 184 (Tb.)
MacFarlane, H. N., 921 (Misc.)
Macfarlane, N. M., with Dyke, 282 (Der.)
Macfie, J. W. S., 10 (Misc.), 471, 792 *bis*, 793 (Z.)
——, & Corson, J. F., 945 *bis* (Hel.)
——, & Ingram, A., 18 (Misc.), 456 (Z.)
——, with Ingram, 461 *bis*, 456 (Z.), 654 (Misc.)
MacGillivray, A., 986 (Oph.)
McGrath, M. J., with Bolton, 720 (Dys.)
MacGregor, A. S. M., & Frew, J., 112 (Am.)
Machado, R., 429 (Misc.)
MacHutchison, G. B., (978) (Mal.)
MacKenna, R. W., 351 (B.R.)
M'Kendrick, A. G., 906 (Misc.)
Mackenzie, J., 473 (Z.)
Mackenzie, A. J., 317, 702 (S.S.)
Mackie, F. P., 49 (Misc.), 92 (K.A.)
——, & Patni, H. C., 871 (K.A.)
Mackie, T. J., 370 (Chl.)
McKinley, E. B., (415) (Dys.)
Mackinnon, M., 915 (Misc.)
McLean, A. J., with Lamson, 922 (Misc.)
MacNeal, W. J., 78 (Pel.)
Macpherson, W. G., Leishman, W. B., & Cummins, S. L., 1005 (B.R.)
Macrae, D. M., 967 *bis* (Mal.)
Macotta, 96 (K.A.)
McVail, J. B., 206, 250, 251 (Hel.)
Madras, 101 (K.A.), 893 (Misc.)
de Magalhaes, P. A., (989) (Oph.)
Magheru, A., with Combiesco & Calalb, 722 (Dys.)
Magliulo, A., 666 (Misc.)
Magnenot, C., 390 (Bb.)
Magrou, J., with Nicolle, 166 (B.R.)
Majocchi, D., 800 (Z.)

Malaria-Commissie voor Noordholland, 962 (Mal.)
Mallannah, S., 487, 834 (Lep.), 580 (R.F.)
Mallardi, M., 100, 569 (K.A.)
——, with Nasso, 571 (K.A.)
Malone, R. H., 592 (Lab.)
Manoukhine, I. I., 972 (Mal.)
Manson-Bahr, P., 140 (Jaun.)
——, with Low, 323 (S.S.)
——, with ——, & others, 702 (S.S.)
——, ——, Pratt, J. J., & Gregg, A. L., 705 (Am.)
Manwaring, W. H., Boyd, W. H., & Okami, S., 739 (Chl.)
Maples, E. E., 491 (Lep.)
Maplestone, P. A., 13 (Misc.), 961 (Mal.)
Marais, D. P., 377 (Und.)
Marchelli, M., with Bertarelli, (373) (Pl.)
Marchoux, E., 156, 825 (Lep.), 658 (Misc.), 712 (Am.), 784 (Z.)
Marcialis, G., (308) (Mal.)
Marcucci Delgado, A., 414 (Dys.)
Marie, A., 602 (Misc.)
Marogna, P., 564 (Mal.)
Marque, Raynaud & Sallet, 753 (Misc.)
Marshall, C. H., with Haase & Hall, 279 (Der.)
——, & Vassallo, S. M., 331 (S.S.)
Marshall, D. G., with Gunn, 973 (Mal.)
Martin, E., with Dekester (430) (Misc.)
Martin, H., & Weir, H. H., 1004 (B.R.)
Martindale, W. H., 404, 710 (Am.)
Martinez, E. A., 465 (Z.)
Martini, E., 766 (B.R.), 793 (Z.)
Martone, V., 560 (Mal.)
Marzinowsky, E. I., 18 (Misc.), 135 (R.F.)
Marzinowsky, V., with Jukov & Sutchkova, 961 (Mal.)
Mashimo, S., 370 (Chl.)
Mason, V. R., 670 (Misc.)
Massey, A. Y., 23 *bis* (Misc.)
Matheson, F., 671 (Misc.)
Mathis, C., 362, 742 (Pl.)
Matignon, J. J., 848 (Misc.)
Matsuo, I., & Izawa, T., 119 (Dys.)
da Matta, A., 428 (Misc.), 797, 801 (Z.)
Matta, C., 831 (Lep.)
Matta, B., & Devoto, A., 490 (Lep.)
Matthews, J. C., & Pearson, C. V., 593 (Lab.)
Mattlet, G., 682 (Misc.)
de Mattos, W. B., 983 (Oph.)
Maunsell, E. C. C., 110 (Am.)
Mauritius, 4, 513 (Misc.)
Maxcy, K. F., 963 (Mal.)
——, & Coogle, C. P., 551 (Mal.)
——, & Ziegler, M. V., 963 (Mal.)
Maxwell, J. L., 752 (Misc.)
Maxwell, J. P., 231 (Hel.)
Mayer, M., 215 (Hel.), 325, 702 (S.S.)
Mayer, E., 563 (Mal.)
Maymone, B., (740) (Chl.)
Mazza, A., & Tiscornia, S., 503 (Oph.)
Mazza, S., 786 (Z.)
——, & Merlo, E. N., 732 (Dys.)
Meded.v. d. Burgerlijk. Geneesk. Dienst in Nederl.-Indië, 21, 753 (Misc.)
Medical Journal of Australia, 927 (Misc.)
Medical Journal of S. Africa, 896 (Misc.)
Medical Research Council, 1003 (B.R.)
Medina Jiménez, R., 395 (Bb.)
Megaw, J. W. D., 755 (Misc.), 812 (Bb.)
——, & Banerji, R. N., 814 (Bb.)
Mehta, B. N., 580 (R.F.)
Mei, A., (260) (Hel.)
Meirelles, E., 480 (Lep.)
Meleney, H. E., & Faust, E. C., 623, 942 (Hel.)
de Mello, F., & de Andrade, M., 137 (R.F.)
——, with França, 216 (Hel.)
——, & Gumarais, A., 663 (Misc.)
——, De Sousa, J., & Guimaraes, A., 660 (Misc.)
——, & Suctancar, C., (479) (Z.)
Mello, S., 112 (Am.)
Melnotte, 127 (Dys.)
Mendel, L. B., with Osborne, 78 (Avit.)
Mendelson, R. W., 233 (Hel.), 905, 919 (Misc.)
Mendoza-Guazon, M. P., 623 (Hel.)
Menk, W., 112, 405 (Am.), 324 (S.S.)
Mesnil, F., 129 (R.F.)
Merlo, E. N., with Mazza, 732 (Dys.)
Meyer, J. R., & Pessôa, S. B., 257 (Hel.)
Mhaskar, K. S., 253, 640 *bis* (Hel.)
——, with Caius, 253 *bis* (Hel.)
Michel, P., with Mouriquand, 80 (Avit.), 397 *bis* (Sc.)
——, with ——, & Bertoye, 399, 819 (Sc.)
Migone, L. E., & Osuna, T., 326 (S.S.)
Mihara, Y., with Muto, 224 (Hel.)
Milio, G., 98 (K.A.)
Miller, F. A., 339, 642 (Hel.)
Miller, H. E., with Morrow & Walker, 161 (Lep.)
Mills, C. A., 597 (Lab.)
Mills, E. A., with Sinderson, 941 (Hel.)
Mills, R. G., 800 (Z.)
Miloslavich, E. L., (644) (Hel.)
Milton, F., (260) (Hel.)
Milton, J., 622 (Hel.)
Minagawa, K., 246 *bis* (Hel.)
Minett, E. P., 900 (Misc.)
Ministry of Health, 406 (Dys.)
Mitchell, J. A., 198 (Tb.)
Mitchell, J. M., Asheshov, I. N., & Richardson, G. P. N., 83 (B.R.)
Mixsell, H. R., 967 (Mal.)
Miyagawa, Y., 222 (Hel.)

Miyanaga, I., with Saka, 143 (Jaun.)
Moffat, R. U., 850 (Misc.)
Molinari, G., 617 (Hel.)
Mollow, W., 102 (K.A.)
Molloy, D. M., 339 (Hel.)
Momplé, F. J. R., 513 (Misc.)
Monge, C., 109 (Am.)
Monier-Vinard, with Renault & Gendron, 571 (K.A.)
Monroe, W. M., 460 (Z.), (684) (Misc.)
——, with Connor, 586 (Y.F.), 792 (Z.)
Monserrat, C., & Africa, C., 947 (Hel.)
Montanari, M., 976 (Mal.)
Monteiro, J. L., 853 (Misc.)
Montes, J. E., (395) (Bb.)
Monteverde, J. A., 563 (Mal.)
Montier, F., 400 (Am.)
Montpellier, J., 823 (Lep.)
——, & Lacroix, A., 234, 633 (Hel.)
——, with Raynaud & Lacroix, 282, 285 (Der.)
Moore, J. J., with Hess & Calvin, 81 (Avit.)
Mora, A. D., & others, 741 (Pl.)
Morales Macedo, C., 287 (Der.)
Moreno, R., with Gros, 796 (Z.)
Morin, H., & Sondag, 995 (Tb.)
Morin, H. G. S., 731 (Dys.)
Morin, J., 704 (Am.)
Morin, with Kernéis, 74 (Bl.)
Morrow, H., Walker, E. L., & Miller, H. E., 161 (Lep.)
Morse, S., 597 (Lab.)
Mortiaux, C., with van Nitsen, 722 (Dys.)
Moselli, 877 (R.F.)
Moshkovsky, S., 927 (Misc.)
Moss, E. S., 203 (Hel.)
Moss, W. L., & Bigelow, G. H., 172 (Ys.)
Motais, 501 (Oph.)
Mottram, J. C., with Cramer & Drew, 854 (Misc.)
Mouchet, A., with Delamare, 881 (Fev.)
Mouchet & Guillermin, 581 (R.F.)
Mouchet, R., & van Nitsen, R., 137 (R.F.)
——, ——, & Gérard, P., 667 (Misc.)
——, with Pearson, 526 (B.R.)
Mouriquand, G., 397 (Sc.)
——, & Michel, P., 80 (Avit.), 397 *bis* (Sc.)
——, ——, & Bertoye, P., 399, 819 (Sc.)
Mühlens, P., & Kirschbaum, W., 295 (Mal.)
Muir, E., with Landeman, E., Roy, T. N., & Santra, I., 826 (Lep.)
——, with Napier, 928 (B.R.)
Mukerjee, S. K., 985 (Oph.)
Mukoyama, T., 211 (Hel.)
Müller, A., 842 (Ys.)
Müller, H., (520) *bis*, 923 (Misc.)
Müller, R., 852 (Misc.)
Muniz, J., with da Cunha, 444 (Z.)
Murard, J., with Combier, 707 (Am.)
Murashima, T., 210 (Hel.)
Murphy, S. J., with Hutchison, 48 (Misc.)
Mutermilch, S., 367 (Chl.)
Muto, M., 211, 618 (Hel.)
——, & Mihara, Y., 224 (Hel.)
Muto, S., & Koshiwo, S., 211 (Hel.)

N

Nagayo, M., & Tamiya, 386 (Fev.)
Nainsouta, 1001 (Tb.)
Nakagawa, K., & Suzuki, S., 936 (Hel.)
Nakajo, S., 239 (Hel.)
Napier, L. E., 93, 100, 567, 570, 571, 865 (K.A.), 425 (Misc.)
——, with Chopra, 845 (Misc.)
——, with Knowles & Gupta, 781 (Z.), 866 (K.A.)
——, & Muir, E., 928 (B.R.)
Näslund, C., with Dernby, 412 (Dys.)
Nasso, I., 570 (K.A.)
——, & Mallardi, M., 571 (K.A.)
Natali, A., (430) (Misc.)
Nattan-Larrier, L., 446 (Z.), 631 (Hel.)
Navarro, R., with Gomez & Kapauan, 666 (Misc.)
Navarro-Martin, A., with Fourneau, 329 (S.S.)
——, & Stéfanopoulo, G. J., 328 (S.S.)
Naville, A., with Guyénot & Ponse, 449 (Z.)
Neeb, H. M., 875 (K.A.)
Negroni, P., (365) (Pl.)
Neiva, A., & Pinto, C., 459 *bis*, 474, 793 (Z.)
Nénon, J., & Bonnet, A., 38 (Misc.)
Nettesheim, W., 236 (Hel.)
Neumann, A., 59 (Misc.)
Neumann, P., 966 (Mal.)
Neveu, R., 429 (Misc.)
Neveu-Lemaire, 152 (Lep.), 228 (Hel.) 792, 795 (Z.)
Newham, H. B., 970 (Mal.)
——, with Low, 499 (Oph.)
——, & Robertson, A., 448 (Z.)
Newman, E. A. R., 979 (Oph.)
Nicholson, F. M., 387 (Fev.)
Nicolai, A., & Straub, M., 36 (Misc.)
Nicolas, C., 429 (Misc.)
——, with Gomez & Basa, 157 (Lep.)
Nicolau, S., with Levaditi, 7 *quat.*, 680, 847, 910, 925 *bis* (Misc.)
Nicoll, W., 203, 625, (644) (Hel.)
Nicolle, C., 37 (Misc.), 96 (K.A.), 290 *bis* (Der.)
——, & Anderson, C., 573, 866 (K.A.)

Nicolle C., Burnet, E., & Conseil, E., 804 (Und.)
——, & Conseil, E., 115, (415) (Dys.)
——, ——, & Cuénod, A., 979 (Oph.)
Nicolle, M., & Magrou, J., 166 (B.R.)
Nicholls, L., 162 (Lep.)
——, & Hampton, G. G., 256 (Hel.)
Nigeria, 509 (Misc.)
Nijland, A. H., 736 (Chl.)
Nikanoroff, S., 359 *ter*., (746) (Pl.)
van Nitsen, R., 672 (Misc.), 842 (Ys.)
——, & Mortiaux, C., 722 (Dys.)
——, with Mouchet, 137 (R.F.)
——, with ——, & Gérard, 667 (Misc.)
——, & Walravens, P., 285 (Der), 675 (Misc.)
Nixon, J. A., 581 (R.F.)
Noc, F., 19 (Misc.), 419, 446 (Z.), 834 (Lep.), 945 (Hel.)
——, & Giglioli, G. S., 420 (Z.)
——, & Huchard, 186 (Tb.)
——, & Kerneis, 31 (Misc.)
——, & Nogue, 207 (Hel.). 418 *bis* (Z.)
——, with Pons, 475 (Z.)
Noël, P., 824 (Lep.)
Noguchi, H., 146 (Y.F.), 809 (Fev.), 885 (Jaun.)
——, & Pareja, W., 146 (Y.F.)
Nogue, 12, 23, 50, 654 (Misc.), 280, 288 *bis* (Der.), 301 (Mal.), (644) (Hel) 744 (Pl.)
——, with Heckenroth, 280 (Der.)
——, with Leger, 960 (Mal.), (165) (Lep)
——, ——, & Hudellet, G., 428 (Misc.)
——, with Noc, 207 (Hel.), 418 *bis* (Z.)
Nöller, 455 (Z.)
Nöller, W., with v. Ostertag & Wolffhügel, 347 (B.R.)
de Nooij, J. A., 245 (Hel.)
Noronha, S., 30 (Misc.)
Norris, W. P., Jacocks, W. P., Winsor, S. A., Gunasekara, S. T. & Keyt, F., 342 (Hel.)
Norwood, B. F., 63 (Misc.)
Noury, O., & Alalou, 738 (Chl.)
——, with Delamare, 42 (Misc.)
Novaro, V., 477 *bis* (Z.)
Nuñez, M. F., 969 (Mal.)

O

Oberlé & Renaud, H. P. J., (430) (Misc.)
O'Brien, A. J. R., with Le Fanu, 580 (R.F.)
O'Brien, H. R., with Beach, 617 (Hel.)
Ocaranza, F., (430) (Misc.)
Ochs, B. F., with Fox, 178 (Ys.)
O'Connor, F. W., 5, 891 (Misc.)
Ogata, N., with Ishiwara, 809 (Fev.)
Ogata, S., 637 (Hel.)
Ogata, T., Kawakita, S., Suzuki, T., Kagoshima, S., & Oka, C., 816 (Bb.)
Ogilvie, W. H., 53 (Misc.)
Ogiwara, H., with Hasimoto, 472 (Z.)
O'Gorman, C. J., 795 (Z.)
Ohba, T., 946 *ter*. (Hel.)
Oho, O., 841 (Ys.)
Ohtsubo, I., 369 (Chl.)
Ohtsuki, M., (365) (Pl.)
Oka, C., with Ogata, Kawakita, Suzuki & Kagoshima, 816 (Bb.)
Okada, S., Sakurai, E., Ibuki, T., & Kabeshuma, H., 815 (Bb.)
Okami, S., with Manwaring & Boyd, 739 (Chl.)
Okuda, M., 394 (Bb.)
Okuda, K., with Inada, Ido, Kaneko, Hoki, Ito & Wani, (144) (Jaun.)
——, with Kaneko, (144) (Jaun.)
Olitsky, P. K., with McCartney, 725 (Dys.)
Olitzki, L., 721 (Dys)
Oliver, T., 475 (Z.)
Olivi, G., 725 (Dys.)
Olivier, P. H., 383 (Fev.)
Ongkiehong, H. F., 124 (Dys.)
Onorato, R., 283, 286, 289 (Der.), 464 (Z.)
Ophthalmological Society of Egypt, 505 (Oph.)
Oppenheimer, E. H., with MacCallum, 847 (Misc.)
Orenstein, A. J., with Pirie, 747 (Ent.)
Orpen, R. W., 688 (S.S.)
Orticoni, A., 293 (Mal.)
——, & Gazzola, M., (415) (Dys.)
Ortiz, P. N., (746) (Pl.)
Osborne, T. B., & Mendel, L. B., 78 (Avit.)
Oshika, H., (430) (Misc)
v. Ostertag, R., Wolffhügel, K., & Nöller, W., 347 (B.R.)
Osuna, T., with Migone, 326 (S.S.)
Ota, M., 277 (Der.)
Otero, P. M., (746) (Pl.)
Otten, L., 741 (Pl)
Oudendal, A. J. F., 673, 675 (Misc.)
——, with van Dijke, 288 (Der.)
Ouzilleau, 632 (Hel.), 750 (Misc.)
——, & Lefrou, 691 (S.S.)
——, with Lefrou, 327, 329 (S.S.)
Ovazza, V. E , 976 (Mal.)
Oyama, R., & Yanagisawa, S., 372 (Chl.)

P

Pacalin, M. G., 980 (Oph.)
di Pace, I., 295, 560 (Mal.)
Pacella, G., (430) (Misc.), 476 (Z.)

Pacheco, G., with de Faria, 719 *bis* (Dys.)
Pacheco-Luna, R., 501 (Oph.)
Padua, R. G., 488 (Lep.), 553 (Mal.)
Paez, F. R., (520) (Misc.)
Pagniez, P., & Ravina, A., 580 (R.F.)
Pais, A., 972 (Mal.)
Palazzo, R., with Grapiolo & Fossati, 584 (Jaun.)
Palestine, 960 (Mal.)
Palmer, L. S., & Hoffman, C. T., 393 (Bb.)
Pam, M. M., 13 (Misc.)
Panayotatou, A. G., 195 (Tb.), 568 (K.A.), 711 (Am.)
Papacostas, G., with Gaté, 99 (K.A.)
Pareja, W., with Noguchi, 146 (Y.F.)
Parham, J. C., 179 (Ys.)
Park, G. W., (479) (Z.)
Parker, R. R., 808 (Fev.)
——, with Spencer, 808 (Fev.)
Parkinson, W. R., 675 (Misc.)
Parmanand, M. J., 656 (Misc.), 881 (Fev.)
Parodi, S. E., & Bonavia, L. L., 500 (Oph.)
Parra, R. F., (165) (Lep.)
Parreiras, D., 64 (Misc.)
Parrish, C. C., 78 (Pel.)
Parrot, L., 461 (Z.), 981 (Oph.)
——, & Donatien, A., 105 (K.A.)
——, & Foley, H., 189 *bis* (Tb.)
——, with Sergent, Edm., Béguet, Lemaire & Vérité, 667 (Misc.)
Paskind, H. A., 55 (Misc.)
Passey, R. D., & Ryle, J. A., 886 (Jaun.)
Patané, C. G., with Fusco, 365, 745 (Pl.)
Paterson, G. W., 843 (Ys.)
Patni, H. C., with Mackie, 871 (K.A.)
Patrick, A., 355 (Bl.), 902 (Misc.)
Patterson, H. A., (261) (Hel.)
Patterson, S. W., 714 (Am.)
——, & Williams, F. E., 409 (Dys.)
Pawlowsky, E., 456 (Z.)
——, & Stein, A. R., 290 (Der.), 467, 474 (Z.)
Payenneville, J., with Dévé, 227 (Hel.)
Payne, F. K., with Ackert, Stoll & Augustine, 949 (Hel.)
——, with Cort, Ackert, Augustine & Payne, G. C., 240 (Hel.)
Payne, G. C., 341 (Hel.)
——, with Cort, Ackert, Augustine & Payne, F. K., 240 (Hel.)
Peacock, W. L., & Duke, H. L., 42 (Misc.)
Pearce, L., (702) (S.S.)
Pearson, A., & Mouchet, R., 526 (B.R.)
Pearson, C. V., with Matthews, 593 (Lab.)
Pedro, A., 796 (Z.), 805 (Fev.)
Pedroso, A. M., 573 (K.A.)
Peking Union Med. Coll., 168, 524 (B.R.)
Pellé, (644) (Hel.)
Pellegrini, A., 880 (Fev.)
Peltier, 45 (Misc.)
Pena Chabarria, A., 674 (Misc.)
Pentimalli, F., 784 (Z.)
Peralta, D., M'Cormick, D. D., Carvajal, M., Pradilla Gonzalez, F., Gomez, A., Valdivieso, J., Serpa, R., & Ardila Gomez, L., 911 (Misc.)
Pereira Lage, F., 852 (Misc.)
Pérez Carreno, L., (430) (Misc.)
Pergola, M., 363 (Pl.)
Perkins, G. A., 160 (Lep.)
Perrin, T. G., 586 (Y.F.)
Perry, H. M. J., 911 (Misc.)
Perry, H. M., 95 (K.A.)
Peryassu, A., 796 (Z.)
Pessôa, S. B., 953 (Hel.)
——, with de Almeida, Junior, 250 (Hel.)
——, with Meyer, 257 (Hel.)
——, with Smillie, 641 (Hel.)
Peterson, E., 144 (Y.F.)
Petit, A., 926 (Misc.)
Petit, P. J., 980 (Oph.)
Pétrault, T., (684) (Misc.)
Peutz, J. L. A., 335 (S.S.)
Peyre, E. L., 640 (Hel.)
——, with Labernadie, 909 (Misc.)
Pezer, O., with Leger, 188 (Tb.)
Phippen, H. G., 642 (Hel.)
Phisalix, M., 525 (B.R.), 604 (Misc.)
Phylactos, A., 432 (B.R.)
Pico, C. E., with Ariazzi, 159 (Lep.)
Pieter, H., 174 (Ys.), 585 (Y.F.)
Pillay, A. P., (520) (Misc.)
Pinaud, J., with Leger & Bédier, 555 (Mal.)
Pinkerton, H., with Wolbach & Schlesinger, 808 (Fev.)
Pinnock, D. D., 846 (Misc.)
Pinto, C., 699 (S.S.)
——, with Godoy, 474 (Z.), 557 (Mal.)
——, with Neiva, 459 *bis*, 474, 793 (Z.)
Piquemal, M., 876 (K.A.)
Pirie, J. H. H., 213 (Hel.)
——, & Orenstein, A. J., 747 (Ent.)
——, with Porter, 210 (Hel.)
Pirot, R., with Sigalas, 143 (Jaun.)
Playfair, K., 233 (Hel.)
Plazy, with Dargein, 379 (Und.), 879 (R.F.)
Plessier, 577 (K.A.)
Pletnew, D. D., 564 (Mal.), 879 (R.F.)
Podiapolsky, P., 136 (R.F.)
Polidori, V., (66), 426, 761 (Misc.)
Pollitzer, R., with Wu Lien Teh & Chun, 365, (746) (Pl.)
Pomaret, M., with Sézary, 578 (R.F.)

Pommé & Sabagh, A.-K., 213 (Hel.)
Pondman, A., 736 (Chl.)
Pons, R., & Noc, F., 475 (Z.)
Ponse, K., with Guyénot & Naville, 449 (Z.)
Porter, A., & Pirie, J. H. H., 210 (Hel.)
Porto Rico Agricultural Experiment Station, 461 (Z.)
Pospelow, W. A., 105 (K.A.)
Poujol, G., 599 (Lab.)
Powell, A., 184 (Tb.), 416 (Sp.), 835 (Ys.)
——, & Bana, F. D., 881 (Fev.)
Pradilla Gonzalez, F., with Peralta, M'Acormick, Carvajal, Gomez, Valdivieso, Serpa & Ardila Gomez, 911 (Misc.)
Prall, S. R., 671 (Misc.)
Prat, S., (308) (Mal.), (430) (Misc.)
Prates, M. M., 502 (Oph.)
Pratt, J. J., with Manson-Bahr, Low & Gregg, 705 (Am.)
Price, J. D., 865 (K.A.)
Pringault, E., 461 (Z.)
de Probizer, G., 76 (Pel.)
Proceedings Transvaal Mine Med. Officers' Assoc., 195 *bis*, 990, 991 (Tb.)
Public Health Reports, 150, 484 (Lep.), 801 (Z.)
Puntoni, V., 740 (Chl.)
Purdy, J. S., 199 (Tb.), 429 (Misc.)

Q

de Quervain, F., 288 (Der.)
Quintini, J., (430) (Misc.)
Quiroga, R., 662 (Misc.)

R

Radosavljevic, A., 303 (Mal.)
Ramoino, P., 76 (Pel.)
Ramond, L., Denoyelle & Lautman, 708 (Am.)
Ramos, O., 903 (Misc.)
Ramsay, G. C., 238 (Hel.)
Randoin, with Lopez-Lomba, J., 818 *bis* (Sc.)
Ransom, B. H., 235 (Hel.)
Rashina, M., 961 (Mal.)
Ravaut, P., 404 (Am.), 560 (Mal.)
Ravina, A., with Pagniez, 580 (R.F.)
Raybaud, J., with d'Astros & Giraud, 875 (K.A.)
Raynaud, with Marque & Sallet, 753 (Misc.)
——, Montpellier, J., & Lacroix, A., 282, 285 (Der.)
Read, B. E., 763 (Misc.)
Rebagliati, R., 380 (Und.)
Reed, A. C., 107 (Am.)
Reed, J. G., 936 (Hel.)
Regnault, F., (338) (S.S.), (978) (Mal.)
Reich, W. W., & Beckwith, T. D., 335 (S.S.)
Reid, C. B. B., 842 (Ys.)
Reilly, J., with Teissier & Gastinel, 745 *bis* (Pl.)
Reinhold, C. H., 110 (Am.)
Reitani, U., 976 (Mal.)
Renaud, H. P. J., with Oberlé, (430) (Misc.)
Renault, J., Monier-Vinard & Gendron, G., 571 (K.A.)
Rennie, P. M., 404 (Am.)
Reynaud, G., (430), 763 (Misc.)
——, & Leger, M., 619 (Hel.)
Reynès, 848 (Misc.)
Rezende, M., 616 (Hel.)
Ribadeau-Dumas, L., 927 (Misc.)
Ricci, O., 564 (Mal.)
Rice, D. A., & Williams, H. O., with Sladden, (261) (Hel.)
Rice, L., 804 (Fev.)
——, with Chandler, 804 (Fev.)
Richards, D. C., 641 (Hel.)
Richards, W. G., 946 (Hel.)
Richardson, C. H., & E. H., 464 (Z.)
Richardson, G. P. N., with Mitchell & Asheshov, 83 (B.R.)
Richet fils, C., 67 *ter.* (H.S.)
Ridley, H. N., 283 (Der.)
Rieux, 294 *bis*, 564 (Mal.)
Rigollet, 474 (Z.)
Riley, W. A., & Shannon, W. R., 224 (Hel.)
Risquez, F. A., 16 (Misc.)
Rivers, W. H. R., 83 (B.R.)
Rivet, L., 967 (Mal.)
Rizal, L. L., with del Rosario, 390 (Bb.), 736 (Chl.)
Robert, L., 629 (Hel.), 669 (Misc.)
Roberti, J., with Berge, Bénard & Guttmann, 227 (Hel.)
Roberts, S. R., (308) (Mal.)
Robertson, A., with Newham, 448 (Z.)
——, with Thomson, 448 (Z.) (732) (Dys.)
Robertson, R. C., 120 (Dys.)
Robertson, W., 851 (Misc.)
Robineau, 163, 822 *ter.* (Lep.), 922 (Misc.)
Rochaix, A., with Courmont, 724 *bis* (Dys.)
Rockefeller Foundation, 643 (Hel.), 856 (B.R.)
Rodenwaldt, E., 915 *bis*, 917 (Misc.)
Rodhain, J., 425, 682 (Misc.), 471 (Z.)
Rodrigues, S. L., 440 (Z.)
Rodriguez Arjona, V., 577 (K.A.)
von Roemer, L. S. A. M., 683 (Misc.)

Roger, G. H., 166 (B.R.)
Rogers, J. M., 416 (Sp.)
Rogers, L., 148, (165), 821, 828 (Lep.), (1002) (Tb.)
Rolland, O., & Jouve, A., 79 (Avit.)
Rollet & Bussy, 987 (Oph.)
Romby, P., 294 (Mal.), 589 (Lab.)
Root, F. M., 458, 789 (Z.)
Rosal, I., 554 (Mal.)
Rosamond, E., 554 (Mal.)
Rosenberger, F., 300 (Mal.)
Rosenberger, G., 423 (Misc.)
Rosenburg, A., 966 (Mal.)
Rosenthal, F., & Freund, R., 337, 700 (S.S.)
Ross, R., 611 (B.R.)
Roth, D. A., 258 (Hel.)
Roubaud, E., 464, 467, 468 (Z.)
——, & Franchini, G., (421) (Z.)
——, & Veillon, R., 463 (Z.)
Rousseau, L., 229, 255 (Hel.)
Routh, L. M., 429 (Misc.)
Rouzaud, Biscons & de Fossey, M., 848 (Misc.)
Row, R., 103 (K.A.), 581 (R.F.), 1000 (Tb.)
Roy, A., 920 (Misc.)
Roy, D. N., 577 (K.A.)
Roy, J. N. with Durante, 34 (Misc.)
Roy, S. C., (74) (Bl.)
Roy, S. K., 629, 630 (Hel.)
——, & Bose, S. C., 230 (Hel.)
Roy, T. N., with Muir, Landeman & Santra, 826 (Lep.)
Rozies, H., 381 (Ud.)
Rucker, W. C., (430) (Misc.)
Rumjanzew, W., with Ioff, 559 (Mal.)
de Ruyter, 499 (Oph.)
Ryle, J. A., 714 (Am.)
——, with Passey, 886 (Jaun.)

S

Sabagh, A.-K., with Pommé, 213 (Hel.)
Sabrié, R., 193 (Tb.)
Saeki, Y., 225 (Hel.)
Saha, J. C., with Banerjee, 573, 869 (K.A.)
Saka, M. & Miyanaga, I., 143 (Jaun.)
Saka, S., 143 (Jaun.)
Sakai, M., 816 (Bb.)
Sakamoto, T., with Tsurumi, Hara, Imai & Aoki, 743 (Pl.)
Sakurai, E., with Okada, Ibuki & Kabeshima, 815 (Bb.)
Salisbury, E. I., (430) (Misc.)
Salles, with Ardin-Delteil & Azoulay, 669 (Misc.)
Sallet, with Marque & Raynaud, 753 (Misc.)
Salm, A. J., 663 (Misc.), 741 (Pl.)
Salvador, W., 429 (Misc.)
Salvat, P., & Fontoynont, M., 278 (Der.)
——, with Fontoynont, 658 (Misc.)
Salvioli, G., 73 (Bl.), 975 (Mal.)
Sambon, L. W., 17 (Misc.), (421), 475 (Z.), (684) (Misc.)
Sanarelli, G., 737 (Chl.)
Sands, J. E., 975 (Mal.)
Sangiorgi, G., 140 (R.F.), 765 (B.R.)
Sanjiva Rao, B., 577 (K.A.)
van Sant, H.M., with Young, 572 (K.A.)
Santos, G., 580 (R.F.)
Santra, I., with Muir, Landeman & Roy, 826 (Lep.)
Saski, S., (373) (Chl.)
Savini, E., 701 (S.S.)
Sawyer, W. A., 345 (Hel.)
Scalas, L., 114 (Am.)
Schaefer, H., 735 (Sp.)
Schalk, H., 302 (Mal.)
Scheunert, A., & Schieblich, M., 80 (Avit.)
Schieblich, M., with Scheunert, 80 (Avit.)
Schiff, F., 564 (Mal.)
Schilling, V., 926 (Misc.)
Schirwind, S., with Yakimoff & Joukowsky (431), 927 (Misc.)
Schlesinger, M. J., with Wolbach & Pinkerton, 808 (Fev.)
Schloessmann, 238 (Hel.)
Schmidt, H., 61 (Misc.)
Schmidt, W. T., 239, 637 (Hel.)
Schmitt, G. P., with Cornwall, 597 (Lab.)
Schneider, O., 390 (Bb.)
Schotte, (684) (Misc.)
Schrieke, B., 683 (Misc.)
von Schroetter, H., 876 (K.A.)
Schüffner, 459 (Z.)
Schueffner, Christophers & de Jonge, 551 (Mal.)
Schueffner, W., 388 (Fev.), 459 (Z.)
——, & Snijders, E. P., 883 (Jaun.)
——, & Vervoort, H., 258 (Hel.)
Schuhalter, W., with Bjekoloff, 135 (R.F.)
Schussler, Jr., H., with Faber, 577 (K.A.)
Schwartz, B., & Tubangui, M. A., 203, 639 (Hel.)
Schwetz, J., 470 *bis* (Z.)
Scialom, D., (430) (Misc.)
Scott, H. H., 733 (Sp.)
Scott, L. C., 383 (Fev.)
de Seabra, A., with Bettencourt & Borges, 217 (Hel.)
Segal, M., 661 (Misc.)
Sei, S., 697 (S.S.), 902 (Misc.)
Seidelin, H., 306, 553 (Mal.)
Seidell, A., 79 *bis* (Avit.)
Seki-Enseli, 956 (Hel.)

Sellards, A. W., 836 (Ys.)
——, & Goodpasture, E. W., 836 (Ys.)
——, —— & de Leon, W., 836 *bis* (Ys.)
——, & Leiva, L., 400, 402 (Am.)
Selmon, A. C., 368 (Chl.)
Semon, H. C., & Christopherson, J. B., 104 (K.A.)
Sen, K. C., 284 (Der.)
Sen, P. B., with Brahmachari, 872 (K.A.)
Sen, R. T., with Shortt, 869 (K.A.)
Sen, S. C., 905 (Misc.)
Senevet, G., 38 (Misc.), (479) (Z.)
——, & Witas, P., 445 (Z.)
Senior-White, R., 461 (Z.)
Sergent, Edm., 21 (Misc.)
——, Béguet, M.; Parrot, L., Lemaire, G., & Vérité, H., 667 (Misc.)
——, & Foley, H., 133 (R.F.)
——, ——, & Vialatte, C., 37 *bis* (Misc.)
Sergent, Et., 876 (K.A.)
Sergent, Et. & Edm., 303, 307 (Mal.)
Sergent, Et., & Catanei, A., 976 (Mal.)
——, Foley, H., & Catanel, A., 560 (Mal.)
Serpa, R., with Peralta, M'Acormick, Carvajal, Pradilla Gonzalez, Gomez, Valdivieso, & Ardila Gomez, 911 (Misc.)
Serra, A., 483, 493 (Lep.)
Sewell, R. B. S., with Annandale, 207 (Hel.)
Seyfarth, 570 *bis* (K.A.)
Sézary, A., & Alibert, J., 30 (Misc.)
——, & Pomaret, M., 578 (R.F.)
Shand, J., 666 (Misc.)
Shanker, H., 987 (Oph.)
Shannon, R. C., 457 (Z.)
Shannon, W. R., with Riley, 224 (Hel.)
Sharp, N. A. D., (702) (S.S.)
Sharpe, F. R., & Lotka, A. J., 298 (Mal.)
Sharpe, W. S., 424, 763 (Misc.)
Shattuck, G. C., 38, 751 (Misc.)
Shaw, B. H., 720 (Dys.)
Shearman, C. H., 728 (Dys.)
Shera, A. G., 375 (Ent.)
Shiiba, Y., & Ushijima, T., 739 (Chl.)
Shillinger, J. E., with Hall, 628 (Hel.)
Shimojo, K., 122 (Dys.)
Shipley, P. G., McCollum, E. V., & Simmonds, N., 394 (Bb.)
Shircore, J. O., 483 (Lep.), 842 (Ys.)
Shortt, H. E., 440, 784 (Z.), 566, 868, 872 (K.A.), 592 (Lab.)
——, & Sen, R. T., 869 (K.A.)
Shorten, J. A., 81 (Avit.)
Shunji, M., 370 (Chl.)
Sicé, 315 (S.S.)
——, & Daude, (430) (Misc.)
Sigalas, R., & Pirot, R., 143 (Jaun.)
Sikora, H., 562 (Misc.)
da Silva, E. P., with Bettencourt, 218 (Hel.)
——, & Figueira, L., 603 (Misc.)
Silva with da Costa, 113 (Am.)
Simon, C. E., 442 (Z.)
Simmonds, N., with McCollum, 81 (Avit.)
——, with Shipley & McCollum, 394 (Bb.)
Simonin, P., 204 (Hel.)
Simonsen, J. L., with Howard & Anderson, 904 (Misc.)
Sinderson, H. C., 655 (Misc.)
——, & Mills, E. A., 941 (Hel.)
Sinton, J. A., 300, 302, 971 (Mal.), 588 (Lab.)
Sirotinin, N., 370 (Chl.)
Sisco, D. L., 640 (Hel.)
Sitsen, A. E., 22 (Misc.)
Sladden, A. F., with Rice & Williams, (261) (Hel.)
Slavoaca, T., 701 *bis* (S.S.)
Smillie, W. G., 249, 259, 951 (Hel.)
——, & Pessôa, S. B., 641 (Hel.)
Smith, H., 764 (Misc.)
Smith, M. I., with Voegtlin, Dyer & Thompson, 695 (S.S.)
Smith, R. O. A., with Dawson, 516 (Misc.)
Smits, J. C. J. C., 106 (Am.)
Snijders, E. P., 712 (Am.), 736 (Chl.), 748 *bis* (Ent.)
——, with Schueffner, 883 (Jaun.)
——, & Stoll, A., 683 (Misc.)
——, & Stoll, A., 683 (Misc.)
——, & Straub, M., 24, 25 (Misc.)
Soares, J., 645 (Misc.)
Soca, F., 62 (Misc.)
Sokoloff, B., 439 (Z.)
Solano Ramos, F., (417) (Sp.)
Solovief, P., with Cuénod, 290 (Der.)
Solowzoff, A. S., with Yakimoff, 878 (R.F.)
Sondag, with Morin, 995 (Tb.)
Soromenho, L., 958 (Mal.)
de Sousa, J., 663 (Misc.)
——, with De Mello & Guimaraes, 660 (Misc.)
South African Institute for Medical Research, 511, 894 (Misc.)
Souvoroff, S., (746) (Pl.)
de Souza, R., 556 (Mal.)
Spaar, E. C., 881 (Fev.)
Spencer, H. A., 291 *bis*, 564, 958, 976 (Mal.)
Spencer, R. R., & Parker, R. R., 808 (Fev.)
Spezzafumo, U., 96 (K.A.)
Spire, 150 (Lep.)
Spittel, R. L., 169 (Ys.), 263 (B.R.)
Stammers, G. E. F., with Brown, 455 (Z.)

Stancanelli, P., 465 (Z.), 874 (K.A.)
Stannus, H. S., 167 (B.R.)
Starobynsky, A., 134 (R.F.)
Starry, A. C., with Warthin, 591 (Lab.)
Steenbock, H., with Hart & Lepkovsky, 398 (Sc.)
van Steenis, P. B., 741 *bis* (Pl.)
Stéfanopoulo, G. J., with Navarro-Martin, 328 (S.S.)
Steffan, 471 (Z.)
Steffan, P., 697 (S.S.)
Stein, A. R., with Pawlowsky, 290 (Der.), 467, 474 (Z.)
Steiner, L. 497 (Oph.)
Stekhoven, Jr., J. H. S., 955 (Hel.)
Stekhoven, S., & Stekhoven-Meyer, S. A. W., 638 (Hel.)
Stekhoven-Meyer, S. A. W., with Stekhoven, 638 (Hel.)
Stephens, E. A., 806 (Fev.)
Stephens, H. F. R., 665 (Misc.)
Stephens, J. W. W., 230 (Hel.), 296, 968 (Mal.), 854 (Misc.)
——, & Yorke, W., 324 (S.S.)
Stévenel, 882 (Y.F.)
Stewart, D. H., 421 (Z.)
Stillmunkés, A., with Bardier, 477 (Z.)
Stitt, E. R., 685 (B.R.)
St. John, J. H., with Bates, 132 (R.F.)
——, & Bates, L. B., 131 (R.F.)
Stocker, C. J., 806 (Fev.)
Stoll, A., with Snijders, 683 (Misc.)
Stoll, N. R., with Ackert, Payne & Augustine, 949 (Hel.)
Stones, R. Y., 632 (Hel.)
Strakosch, W., 564 (Mal.)
Straub, M., with Nicolai, 36 (Misc.)
——, with Snijders, 24, 25 (Misc.)
Sträussler, E., & Koskinas, G., 977 (Mal.)
Strickland, C., 292 (Mal.)
Strong, R. A., 77 (Pel.)
Strong, R. P., (430) (Misc.)
Stutzer, M. J., 409 (Dys.)
Stutzer, M. I., 372 (Chl.)
Suctancar, C., with de Mello, (479) (Z.)
Suemori, 503 (Oph.)
Suganuma, S., 233 (Hel.)
Suldey, E. W., 389 (Bb.)
Sumner, F. W., 667 (Misc.)
Sundstroem, E. S., 759 (Misc.)
Surbek, K., 561 (Mal.)
Sutchkova, O., with Jukov & Marzinowsky, 961 (Mal.)
Suyemori, S., 209, 221 (Hel.)
Suzuki, S., 618, 936 (Hel.)
——, with Nakagawa, 936 (Hel.)
Suzuki, T., with Ogata, Kawakita, Kagoshima & Oka, 816 (Bb.)
Swaminath, C. S., with Cragg, 789 (Z.)
Swanbeck, C. E., 597 (Lab.)
Swarup, A., 676 (Misc.)
Sweet, W. C., 954 (Hel.)
Swellengrebel, N. H., 360 (Pl.), 459 (Z.)
Swezy, O., 787 (Z.)
——, with Kofoid, 713 (Am.)
——, with ——, & Boyers, 713 (Am.)
——, with ——, & Kornhauser, 592 (Lab.)
Swynnerton, C. F. M., 311 (S.S.), 469 (Z.)
Symons, T. H., 101 (K.A.)
Szereszewshi, L., with Szymanowski, 120 (Dys.)
Szymanowski, Z., & Szereszewski, L., 120 (Dys.)

T

Tainan Mission Hospital, 752 (Misc.)
Takagi, S., with Tochihara, 636 (Hel.)
Takeda, H., with Kodama, 372 (Chl.)
Talbot, 507, 979, 980 (Oph.)
Taliaferro, W. H., 788 (Z.)
——, & Becker, E. R., (479) (Z.)
Talwik, S., 149 (Lep.)
Tamiya, S., 834 (Lep.)
——, with Nagayo, 386 (Fev.)
Tanabe H., 208 *bis* (Hel.)
Tanaka, A., 725 (Dys.)
Tanaka, T., 415 (Dys.)
Tanganyika Territory, 483 (Lep.)
Tanon, L., 438 (Z.)
——, & Cambessédès, 743 (Pl.)
——, with Bordas & Dubief, 361 (Pl.)
Tarassévitch, L., 557 (Mal.)
Tate, G., 65 (Misc.)
Taylor, F. E., with Castellani, 424, 920 (Misc.)
Taylor, J. A., 909 (Misc.)
Taylor, M. R., 475 (Z.)
Tebbutt, A. H., & McConnel, S. V., (431) (Misc.)
Teissier, P., Gastinel, P., & Reilly, J., 745 *bis* (Pl.)
Tejera, E., 575 (K.A.)
Teppaz, L., 187 (Tb.)
Terra, F., Torres, M., da Fonseca, O., & Arêa Leão, A. E., 278 (Der.)
Terrien, E., with Bizard, 569 (K.A.)
Thavara, M. C., 903 (Misc.)
Theunissen, W. F., 601 (Misc.)
van Thiel, P. H., (260) (Hel.)
Thiroux, A., 651 (Misc.)
Thomas, W. S., 437 (Z.)
Thompson, J. W., with Voegtlin, Smith & Dyer, 695 (S.S.)
Thompson, L., 597 (Lab.)
Thomson, J. G., & Robertson, A., 448 (Z.), (732) (Dys.)
Thomson, J. W., 650 (Misc.)

Thomson, T., with Castellani & Douglas, 657 *bis* (Misc.)
Thoulon, (365) (Pl.)
Ticho, A., 502 (Oph.), 795 (Z.)
Tidy, H. L., 735 (Sp.)
Tiscornia, S., with Mazza, 503 (Oph.)
Tissot, with Gastou, 576 (K.A.)
Titowa, N. A., with Kulescha, 578 (R.F.)
Tochihara, I., & Takagi, S., 636 (Hel.)
Toide, G., 212 (Hel.)
Tomb, J. W., 736 (Chl.), 944 (Hel.)
Torii, K., & Watanabe, H., 229 (Hel.)
Torregrosa, A., 646 (Misc.)
Torres, M., with Terra, da Fonseca & Arêa Leão, 278 (Der.)
Tournier, 34 (Misc.)
——, with Lachaume, 228 (Hel.)
Tournier, E., 180 *bis* (Ys.), (261), 635 (Hel.)
Toyama, C., 395 (Bb.)
Toyoda, T., with Tsurumi, 368 (Chl.)
Trabaud, with Lasnet, (1002) (Tb.)
Trager, V. B., with Lyon, 597 (Lab.)
Transactions of the 4th Congress of the Far Eastern Association of Tropical Medicine, 551 (Mal.)
Transvaal, Proceedings Mine Med Officers' Assoc., 195 *bis*, 990, 991 (Tb.)
Traub, E. F., with Goodman, 842 (Ys.)
Treutlein, A., 302 (Mal.)
Tricoire, R., 908 (Misc.)
Trolli, 624 (Hel.), 673 (Misc.)
Tsurumi, M., & Toyoda, T., 368 (Chl.)
Tsurumi, S., Hara, C., Sakamoto, T., Imai, M., & Aoki, T., 743 (Pl.)
Tsykalas, 215 (Hel.)
Tubangui, M. A., with Schwartz, 203, 639 (Hel.)
Tucker, J. P., with Kofoid, 248 (Hel.)
Tuffier, T., 15 *bis* (Misc.)
Turner, C., (644) (Hel.)
Tyau, E. S., (260) (Hel.)

U

Ubago, M., (431) (Misc.)
Uchida, M., (496) (Lep.)
Uchimura, R., 626 (Hel.)
Uganda Protectorate, 691 (S.S.)
Ugi, S., 942 (Hel.)
Uhlenhuth, P., & Zuelzer, M., 582 (Jaun.)
Ukil, A., 292 (Mal.)
Unna, P. G., 487 (Lep.)
Usami, K., & Kamada, R., 205, 237 (Hel.)
Ushijima, T., with Shiba, 739 (Chl.)

V

Vaccarezza, R. F., with Destefano, 525 (B.R.)
Vadala, A. J., with Cooper, 642 (Hel.)
Vaglio, R., 96 (K.A.)
Valcke, G., 690 (S.S.)
Valdivieso, J., with Peralta, M'Acormick, Carvajal, Pradilla Gonzalez, Gomez, Serpa, & Ardila Gomez, 911 (Misc.)
Valenzuela, A. J., 639 (Hel.), 850 (Misc.)
Vallarino, J. J., (431) (Misc.)
Vallet, E. M., 14 (Misc.)
Valois, G., & Lemoine, P., 987 (Oph.)
Valverde, B., 482, 485, 491, 823 (Lep.)
van de Velde, E., 583, 884 (Jaun.)
van den Branden, 182 (Ys.)
——, & van Hoof, 43, 45 (Misc.), 177 (Ys.), 329, 698, 702 (S.S.), 934 (Hel.), 959 (Mal.)
van den Hoven van Genderen, A. J., 603 (Misc.)
van der Hoek-van Eelders, H. G. C., 807 (Fev.)
van der Walle, 393 (Bb.), 765 (B.R.)
van der Zijl, A., 653 (Misc.)
Vanni, V., 141, 884 (Jaun.)
Vanzetti, F., 732 (Dys.)
Varadarajan, P. S., with Cunningham, 865 *bis*, 872, (K.A.)
de Vasconcellos, A., with Cerquiera, 575 (K.A.)
Vassallo, S. M., 357 (Pl.)
——, with Marshall, 331 (S.S.)
Veillon, R., with Roubaud, 463 (Z.)
Veit, R., (261) (Hel.)
Veldee, M. V., 966 (Mal.)
Velho, A., 559 (Mal.)
Velho, L. B. de A., 316 (S.S.)
Vérité, H., with Sergent, Edm., Béguet, Parrot & Lemaire 667 (Misc.)
Vernet, I., 480, 482 (Lep.)
Verrotti, G., 105 (K.A.)
Versari, A., 491 (Lep.)
Vervoort, H., 583 (Jaun.), 849 (Misc.)
——, with Schüffner, 258 (Hel.)
Verwey, A., 984 (Oph.)
Vialatte, C., 296 (Mal.)
——, with Sergent, Edm., & Foley, 37 *bis* (Misc.)
Vieira, B., 145 (Y.F.)
Vieira, J. P. B., 289 (Der.)
Vignes, H., 307 (Mal.)
Villain, G., 96 (K.A.)
Villard, H., 467 (Z.)
Villela, E., with Chagas, 335 (S.S.)
Vincent, G. E., 856 (B.R.)
Vincent, H., 381 (Und.)
Visuvalingham, S. A., with Fletcher, 970 (Mal.)

Viswalingam, A., 182 (Ys.)
Vitrex Glass, 499 (Oph.)
Voegtlin, C., Smith, M. I., Dyer, H., & Thompson, J. W., 695 (S.S.)
de Vogel, W. T., (431) (Misc.)
Vomela, S., 883 *bis* (Y.F.)

W

Wachowiak, M., with Fleisher, 921 (Misc.)
Wade, H. W., (520) (Misc.)
——, with Cabrera, 427 (Misc.)
Wade, T. W., 406 (Dys.)
Wagner-Jauregg, 973 (Mal.)
Walch, E., 258 (Hel.), 473, 800 (Z.), 880 (Fev.)
Walker, E. L., 154 (Lep.)
——, with Morrow & Miller, 161 (Lep.)
Walker, E. M., 467 (Z.)
Walker, F. D., 420 (Z.)
Walker, P. H., 851 (Misc.)
Wallace, A., 154 (Lep.)
Wallace, M. E., (261) (Hel.)
Walravens, P., 39 *bis* (Misc.), 959 (Mal.)
——, with van Nitsen, 285 (Der.), 675 (Misc.)
Wani, H., with Inada, Ido, Kaneko, Hoki, Ito & Okuda, (144) (Jaun.)
——, with ——, ——, Hoki & Ito, (144) (Jaun.)
Warasi, W., 371 (Chl.)
Warthin, A. S., & Starry, A. C., 591 (Lab.)
Wassilewsky, W. J., with Yakimoff, (431) (Misc.)
Watanabe, H., with Torii, 229 (Hel.)
Watanabe, K., 229 (Hel.)
Watanabe, T., (732) (Dys.)
Watkins-Pitchford, W., 511, 894 (Misc.) 625 (Hel.)
Watson, G. A., 728 (Dys.)
Watson, M., 458 (Z.)
Watson-Williams, P., 764 (Misc.)
Watts, R. C., 934 (Hel.)
Webb, W. L., 515 (Misc.)
Weber, H. H., 974 (Mal.)
Weill, E., Arloing, F., & Dufourt, A., 80 (Avit.)
Weir, H. H., with Martin, 1004 (B.R.)
Wellcome Bureau of Scientific Research 84 (B.R.)
Wells, A. H., Agcaoili, F., & Feliciano, R. T., 429 (Misc.)
Welsh, R. H., (431) (Misc.)
Wenyon, C. M., 353 (Bl.), 437, 527 785, 855 (Z.), 976 (Mal.)
von Werdt, F., 721 (Dys.)
Wesener, 299 (Mal.)
Wheeler, G. A., 75 (Pel.)
——, & Goldberger, J., 77 (Pel.)
Whelply, Jr., F. R., 260 (Hel.)
Whitehead, W. T., 660 (Misc.)
Whitmore, E. R., 302 (Mal.)
Whittingham, H. E., 385 (Fev.), 414, 731, (732) (Dys.)
Wibaux, with Cavaillon, 406 (Dys.)
Wickersheimer, E., 745 (Pl.)
Widal, F., Abrami, P., & Joltrain, E., (520) (Misc.)
Widowitz, P., 723 (Dys.)
Wieberdink, T., 199 (Tb.)
Wiggins, C. A., 72 (Bl.)
Wijdooghe, J., (431) (Misc.)
Wilkinson, E., 146 (Y.F.)
Williams, E. G., (308) (Mal.)
Williams, F. E., with Patterson, 409 (Dys.)
Williams, H. O., with Rice & Sladden, (261) (Hel.)
Williamson, G. A., 622 (Hel.)
Willmore, J. G., 708 (Am.)
Wilson, C. E., 792 (Z.)
Wilson, H. F., 215 (Hel.)
Wilson, R. M., 827 (Lep.)
von Wilucki, 307 (Mal.)
van Winkle, C., with Hogue, 784 (Z.)
Winsor, S. A., with Norris, Jacocks, Gunasekara & Keyt, 342 (Hel.)
von Winterfeld, (644) (Hel.)
Witas, P., with Senevet, 445 (Z.)
Woensdregt, M., & van Dam, C., 965 (Mal.)
Wolbach, S. B., Pinkerton, H., & Schlesinger, M. J., 808 (Fev.)
Wolffhügel, K., with v. Ostertag & Nöller, 347 (B.R.)
Wollman, E., 463 (Z.)
Wood, E. J., 55 (Misc.)
Woodcock, H. M., 676, 677 (Misc.)
Wrenshall, R., with Dean, 160 (Lep.)
Wright, C., 676 (Misc.)
Wright, R. E., 498, 984 *bis* (Oph.), 796 (Z.)
Wu Lien Teh, 54, 82 (Misc.), (B.R.)
——, Chun, J. W. H., & Pollitzer, R., 365, (746) (Pl.)

Y

Yakimoff, W. L., 786 (Z.), 803 (Und.) 868 (K.A.), (987) (Mal.)
——, Joukowsky, A., & Schirwind, S., (431), 927 (Misc.)
——, & Solowzoff, A. S., 878 (R.F.)
——, & Wassilewsky, W. J., (431) (Misc.)
Yamada, S., 233 (Hel.)
Yamaguchi, S., 617 (Hel.)
Yamaguti, K., 476 (Z.)
Yanagisawa, S., with Oyama, 372 (Chl.)
Yokogawa, S., with Cort, 208 (Hel.)
Yomanouchi, T., (373) (Chl.)

Yorke, W., 572 (K.A.)
——, & Adler, S., (165) (Lep.)
——, with Stephens, 324 (S.S.)
Yoshida, S., 223 (Hel.)
Yoshioka, M., 724 (Dys.)
Young, C. J., 460 (Z.)
Young, C. W., & van Sant, H. M., 572 (K.A.)
Young, T. C. M., 94, 567 (K.A.)
Yugo Slav Malaria Commission, 557 (Mal.)

Z

Zabolotny, D. K., 358, (746) (Pl.), 372 (Chl.)
Zapata, C. E., 145 (Y.F.)
Zeller, H., 136 (R.F.)
Zenin, A., 875 (K.A.)
Ziegler, M. V., with Maxcy, 963 (Mal.)
Zielaskowski, M., with Leichtentritt, 337 (S.S.)
Zilva, S. S., 80 (Avit.)
——, with Drummond, (520), 763 (Misc.)
——, ——, with Coward, 763 (Misc.)
Zironi, A., 494 (Lep.), 697 (S.S.)
Zlatogoroff, 877 (R.F.)
——, Gorodkowa, A. A., & Karetnikowa, W. W., 717 (Dys.)
Zotta, G., 444 *bis*, 788 (Z.)
Zuelzer, M., 143 (Jaun.)
——, with Uhlenhuth, 582 (Jaun.)
Zwanck, A., with Carbonell, 627 (Hel.)

INDEX OF SUBJECTS.*

Compiled by MISS M. H. JAMES.

AMOEBIASIS (AMOEBIC DYSENTERY, LIVER ABSCESS, *&c.*), 106-28, 400-15, 703-32, 1002
- Amoebae and Entamoebae associated with
  - Cysts, Plasmolysis in, **712**
  - Intestinal: Morphology, **714**
  - Non-Iodophil in Pigs, **113**
  - *dysenteriae* in
    - Bone Marrow in Arthritis Deformans, Mitosis in, **713**, 1002
    - Lymph Glands in Hodgkin's Disease, Mitosis in, **713**
- AMOEBIC DYSENTERY, **106, 413**
  - in Cat: Effect of Stasis on Development, **400**
  - Carriers: German Navy, 703
    - Investigation of: Manila, 722
  - Complement Deviation in, **114**
  - Complications, **400**
  - Diagnosis, **107**
    - Biliary Test in, **703, 714**
  - with Gangrene of Hepatic Flexure of Colon, and of Liver, **401**
  - Hodgkin's Disease after, **111**
  - Incidence
    - Class, **703**, 728
    - Geographical
      - Australia, 728
      - Dutch East Indies, 413
      - England, 728
        - Indigenous, **714**
      - Federated Malay States, 412, 413
      - Kenya, 510
      - Morocco: Association with Malaria, **908**
      - Nigeria, 510
      - Shanghai, **106**, 728
      - Sicily, 111
      - South Africa, 512
      - Sydney, N.S. Wales, 413
      - U.S.A., 107
      - West Indies, 125
    - in Women, **714**
  - Infantile: Treatment: Calomel, **714**
  - Latent and Chronic, **111**

Amoebiasis—*cont.*
- AMOEBIC DYSENTERY—*cont.*
  - Obscure Forms, **400**
  - Surgical Aspects, **107**
  - Titles of Papers briefly Noticed, 114-15
  - Treatment, **107, 402**
    - Refractory Cases, **708**
    - Various Methods
      - Alcresta and Emetine, **112**, 509
      - Calomel, **113, 714**
      - Châtelguyon Water, **703**
      - Emetine Injections, **112**
      - Emetine-Bismuth-Iodide: Solubility, **404**
      - New, **113**
      - Stovarsol: Rapid Cure, **712**
      - Surgery, **106**
      - Two Methods, **404**
      - Yatren, **112** *bis*, **405** *ter*, **712**
- AMOEBIC HEPATITIS
  - Acute; Fever Masking, **401**
  - Classification, **109**
  - Obscure form, **704**
  - Suppurative, Cured by Emetine, **705**
  - in Switzerland, **704**
- AMOEBIC PULMONARY ABSCESS
  - Cured by Emetine, **708**
- AMOEBO-SPIRILLARY, **126**
- LIVER ABSCESS, **108**
  - Arneth Index, **110**
  - Diagnosis, Radioscopic, Insufflation of Abdomen and, **704**
  - Incidence
    - Australia, 728
    - Caracas, **108**
    - Morocco, 108
    - West Indies, 125
  - Large: Treatment, **707**
  - Rupture into Abdominal Cavity, **110**
  - Small: Diagnosis of, Emetine Test in, **401**
  - Treatment, 108, **110**
    - Aspiration, **705, 714**
    - Emetine, **108, 110, 705**
    - Operation: Report of, 100, **708**
    - Rogers's Method, 109

---

* The Numbers in heavy type refer to the titles of papers summarized.

AVITAMINOSES, 78–81
- in Pigeons
  - Auto-immunization, **80**
  - Treatment by Intestinal Microbes, **80** *bis*
- Polished Rice Disease, Experimental, in Pigeons: Treatment, **80** *bis*
- Vitamin-Activated Fuller's Earth: Preparation, **79**
- Vitamin(s)
  - B Distribution, **78** *bis*
  - Inactivation of, **80**
  - Preservation of, **79**
  - Products, Activity of: Physiological Test, **79**
    - Proprietary, Experiments with, **81** *bis*
  - Rôle of, in Tropical Diseases, **81**

BERIBERI AND POLYNEURITIS AVIUM (*see also* **AVITAMINOSES**), 389–95, 812–17
- Acidosis in, **816**
- Drought-induced, 852
- and Epidemic Dropsy, **812**
- Epidemic Dropsy Type [Allahabad], **814**
- Etiology, **389**, 395
- Incidence: All Forms
  - Geographical
    - Brazil, 389
    - Cabo Verde, 852
    - Gabon, **389**
    - India: Allahabad, 814
    - Japan, 395
    - Mesopotamia: Kut, 53
    - Philippine Islands, 390
    - [Venezuela]: Problem of, **395**
  - Race: Senegalese, 390
- INFANTILE
  - Blood-Findings in, **816**
  - Prophylaxis and Cure by Tikitiki Extract, **390**
- Lipoid-Metabolism in, Significance of, **391**
- Lipochromes as Vitamins, **391**
- Obscure Form, **390**
- and Pellagra, Combined, **905**
- POLYNEURITIS AVIUM
  - Action in, of Rice Embryo, **394**
  - Biochemical Properties of Pigeons' Blood in, and in Starvation, **393**
  - Nerve Lipoids from, Electrical Exam. of, **816**
  - Polished Rice Disease and Experimental Destruction of so-called Beriberic Vitamin, **394**
- Post-operative, **390**

Beriberi—*cont.*
- in Rats, Bone Lesions of, **394**
- Rice, Century-old, Nutrient Value of, **814**
  - Korintji, D.E.I., Tests of, for Vitamin B, 21
- So-called, of Monkeys, &c., **392**
- Title of Unnoticed Paper, **395**
- Urine Analysis and Metabolism, **816**
  - Antineuritic and Antiscorbutic Vitamins in, **393**
  - Double Refractory Lipoid in, **391**
- Vitamin Value of Food Stuffs, **814**
- Vitamin B Deprivation: Experimental Studies, **815** *bis*, **816**

BLACKWATER FEVER, 71–74, 353–6
- Blood Transfusion in, **73**, **74** *bis*
- Cases, **355**, 509, **883**
- Clinical Observations, **72**
- Complicated by Retinal Haemorrhage, **355**
- Diagnosis, Differential, 647
- Etiology, **71**, **72**
- Incidence
  - Geographical
    - Bengal, **292**
    - Congo, Belgian, **353**, 355
    - Dahomey, 749
    - Nigeria, 509, 510
    - Papua, **72**
    - Portuguese E. Africa: Epidemiology, 1901–20, **958**
    - Senegal, 71, 73, 353
    - Uganda, **72**, 355
  - Race, 72, 73, 74
- Kidneys in, Minute Pathology of, **73**
- and Malaria, 71, **74**, 292, **964**
- Micro-organisms in Liver, 72
- Pathology, **356**
- Spirochaetes in Blood in, **138** *bis*, **353** *ter*
  - Erratum, **202**
- Title of Unnoticed Paper, **74**
- Treatment, **73** *bis*, **74**, **356**
  - Calmette's Anti-Venom, **356**
  - Experimental, **71**
  - Gouzien's Method, 949 *& n.*

Bubo, Climatic, **665**, **666** *bis*
- Histological Changes, **902**
- and Lymphogranuloma, **35**, **666**
- Velez: Bogota, **674**

Carrion's Disease, 810–11

Cerebrospinal Meningitis.
- Incidence: Belgian Congo, **43**
- Prophylaxis, 43

CHOLERA, 366–73, 736–40
- Acidosis of, and its Therapy, **368**
- Arneth Count in, and in Healthy Bengalese, **371**
- Bacteriaemia of, and Recovery of Vibrios from Bile, **370**
- Bacteriology
  - *V. cholerae*
    - with Atypical Colonies Spontaneously Agglutinable, **372**
    - in Carriers: Localization, **736**
    - Cases in which Not Found, **367**
    - Cultivation
      - Iod-Phenomena in, **369**
      - New Medium, **369**
    - Endotheliotoxin of, **739**
    - Fate of, in Pfeiffer's Phenomenon, **369**
    - Infection and Immunization Experiments with, **370**
    - Modes of Entrance and Exit, **737**
    - Nature of, **739**
    - New Biological Reaction of, **372**
    - Serological Relationships to, of the Paracholera Vibrios, **370**
    - Strains
      - Atypical: Action on Sugars, **738**
      - Japanese, &c., 1921, **739**
      - Woronesh, **372**
    - Survival for 10 years in Peritoneal Fluid, **740**
    - of Tchilinguir, **372**
- Bacteriolysant in Cholera Patients' Intestine, **740**
- Carriers, Healthy, 367, 371
- with Complications, **368**
- Diagnosis
  - Rapid Method, **738**
  - Starch Peptone Water: Value, **739**
- Dysentery Misdiagnosed as: Mesopotamia, **764**
- Histopathology of Intestine in, **739**
- House Infection, **906**
- Incidence
  - Geographical
    - Dutch East Indies, 736
    - India
      - Bengal, **371**
        - Coalfields, 736
      - N.W. Frontier Force [Epidemic], **366**
    - Persia, 366
    - Philippine Islands: Epidemiology, **736**
    - Russia, **366**, 372

Cholera—*cont.*
- Incidence—*cont.*
  - Race and Class
    - Polish Army (1920–21), **367**
- Infection, Influence on, of *B. proteus*, **370**
- Leucocytic Counts in, and in Healthy Bengalese, **371**
- Muscle Changes in, **371**
- Pathogeny, **737**
- Prophylaxis
  - Anti-Cholera Vaccine
    - Dried: Preparation, **595**
    - in D.E.I., **736** *bis*
    - *per os*, **372**
  - Essential Oils: Value, **736**
- Starvation Diarrhoea mistaken for, 53
- Stools, Lytic Principle in, for Shiga's Bacillus, **370**
  - Poisonous Constituent in, **739**
- Titles of Unnoticed Papers, 373, 740
- Treatment by Essential Oils: Value, **736**
- Vaccine, Sensitized, Duration of Efficacy of, **372**
- Vibrio-spirochaetic (Vibriothrix) Pseudosymbiosis, **908**
- Without Vibrios, **367**

DENGUE, 383–5, 388, 804–7
- Etiology, **804**
- Fevers resembling, *see under* **FEVERS, UNCLASSED**
- Incidence, Geographical
  - Japan, **805**
  - Macedonia, 383
  - Nictheroy, **805**
  - Pescadores, **805**
  - U.S.A., 804, 805
    - Galveston (Epidemic, 1922), **804**
    - Louisiana, **383**
  - [Vienna], **383**
- Insect Vectors, 299, 383, 384
- or Pappataci Fever, at Beyrouth, **384**
- Research: Oct.–Nov., 1922, **805**
- [Survey of its Literature], **383**
- *versus* Malaria, **299**

DERMATOLOGY, TROPICAL, 277–90
- DISEASES
  - Blastomycosis: Local, **279**
  - Blue Stains in Man: Causes, **290**
  - Dermatitis
    - Insect, 472, 800, 801
    - Plant, **283**
    - Salvarsan, **653**
    - Verrucosa and Leishmania [Brazil], **278**
  - Dermatomycoses
    - Madagascar, **278, 279**

Dermatology, Tropical—*cont.*
- DISEASES—*cont.*
  - Dermatomycoses—*cont.*
    - Manchuria, **277**
    - [Porto Rico], **277**
  - Granuloma inguinale
    - First Case: Peru, **287**
    - with Lesion of Lower Lip, **286**
    - [Non-Tropical], **288**
    - Treatment by Tartar Emetic, 286, **287**
    - Ulcerating
      - Tripoli, **286**
      - U.S.A., **287**
  - Mycetoma
    - Black-grained
      - Mauritania, **280**
      - West Africa, **280** *bis*, **282** *bis*
    - of Foot: South Africa, **282**
    - of Leg: India, *Streptothrix* n.sp. from, **282**
    - Red-grained
      - Mauritania, 281
      - West Africa, **280** *ter*
    - White-grained: Algeria, **282**
  - Otomycosis, Brazil, **279**
  - Pemphigus: Treatment by Chaulmoogra Oil, **289**
  - Phagedaena: Tripoli, **283**
    - Treatment, **285**
      - Solar Radiation, **284**
  - Prevalent in Libya, **277**
  - Rhinoscleroma
    - Brazil, 429
    - D.E.I., **683**
  - Ringworm due to *Trichophyton crateriforme* [Peru], **277**
  - Sporotrichosis: Madagascar, **659**
    - *Sporotrichum Carougeaui* n.sp., Madagascar, **659**
  - Ulcer, Chronic Venereal, **285**
  - Ulcus tropicum
    - North Palestine, **284**
    - South Africa: *B. fusiformis* present, 511
    - Treatment by Vaccinotherapy, **285**
  - Veldt Sores: Treatment by Antidiphtheritic Serum, **286**
  - Xeroderma pigmentosum and Light Rays, **290**
    - Tunis, **290** *quat*
- PARASITES, FUNGI, &c.
  - *Cladosporium Wernecki*, **280**
  - *Endomyces molardi* n.sp., Sub-Dermal Abscess due to: Madagascar, **278**
  - *Hermodendron Fontoynonti* n.sp., 279
  - *Madurella mycetomi*: Culture, **280**

Dermatology, Tropical—*cont.*
- PARASITES, FUNGI, &c.—*cont.*
  - *Sterigmatocystis Hortai* n.sp., from Brazilian Otomycosis, **279**
  - *Streptothrix* n.sp., from Mycetoma of Leg: India, **282**

DYSENTERY, BACILLARY, CILIATE, FLAGELLATE, MIXED AND UNCLASSED, 115–28, 406–12, 714–32
- BACILLARY, 115–25, **413**, 714–26
  - Acute: Rhubarb in, **411**
  - Asylum and Allied Forms, **720**
  - Bacilli associated with
    - *dysenteriae*
      - Classification, **119**
      - Differentiation, **116**, **117**
      - Flexner: Persistent Infection, **117**
        - Inagglutinable: Behaviour towards Anti-Flexner Bacteriophages, **725** *bis*
      - Flexner Group: Standard Agglutinable Cultures of, **409**
      - New Culture Phenomenon, **122**
      - Non-Acid, **725**
      - Shiga: Autolysis, 123, **124**
        - Bacteriophage of, 123, **124**
        - Lytic Principle for, got by Filtered Culture of *B. coli*, **726**
        - Reduction by, of Amino-Acids into Amines, **410**
        - Toxins of, and Immunization against, **120**, **121**
          - Separation of, **723**
      - Sonne Type, **409**
      - Toxin of, Soluble, **724**
      - Variations, **119**, **120**
      - Variations in Sugar Fermentation by, **724** *bis*
      - Y Epidemic, Breslau, **721**
    - *metadysentericus*: Virulence in Rabbit: Resistance to Sunlight, **725**
    - *paradysenteriae* X [East Prussia], **409**
  - Bacteriological and Clinical Consideration of [All ages], **714**
    - *Escherichia braziliensis* in: Brazil, 408, 719
    - Organisms of Dysentery-coli Group, Relation of Growth of, to H-ion Concentration, **412**

Dysentery—*cont.*
- BACILLARY—*cont.*
  - Blood Picture, **728**
  - Carriers, **117**
  - Chronic, **408, 719**
    - Morbid Anatomy, **721**
  - Dysenteric Intoxication of Rabbit by Ingestion of Soluble Dysenteric Toxins, **410**
  - Dysentery Agglutination in Children, **723**
    - Antitoxic Serum, Titre of, Estimation of, **411**
    - Toxin, Nature of, **411**
  - Etiology, **717**
  - Incidence
    - Age: Children, **704, 718,** 719
    - Asylums, 728
      - Floor Treatment, **720**
    - Geographical
      - Australia, 728
        - Adelaide, 718
        - Sydney, N.S.W., 413
      - Breslau: Y Epidemic, **721**
      - D.E.I., **408,** 413, 719
      - F.M.S., 412
      - France, Aisne, **406**
      - Glamorganshire, **406**
      - Kenya: Decrease, 510
      - Petrograd: Epidemic, 1920, **717**
      - Rio de Janeiro, 116, **408, 719** *ter*
      - Saarbrucken and Saarlouis Districts, 1914–20 **717**
      - Shanghai, 728
      - Tunisia, Southern, 115
      - U.S.A., 117
  - Intestinal Bacteriophage, **721**
  - Intoxication with, of Guinea-Pig, **122**
  - Misdiagnosed as Cholera: Mesopotamia, **764**
  - Pathogenesis, **715**
  - Prophylaxis, 412
    - Vaccination *per os*, **115**
  - Spread by
    - Carriers, **117**
    - Convalescents, 117
  - Stools: Serological Properties, **121**
  - Treatment of Acute, **118**
    - Various Means
      - Rhubarb, **411, 722**
      - Serotherapy, **118** *bis*, **719**
      - Vaccinotherapy, **722**
        - by Mouth and Skin in Rabbits, 722 *bis*
- CILIATE, OR BALANTIDIASIS
  - Balantidial Colitis [Budapest], **415**
  - in Chimpanzee, Berlin, **127**

Dysentery—*cont.*
- CILIATE, OR BALANTIDIASIS—*cont.*
  - Incidence
    - [North Africa], **127**
    - West Pacific, 7
- FLAGELLATE
  - Pathogenicity and Treatment, **414, 731**
  - Treatment
    - Novarsenobenzol orally, **732**
- HELMINTHIC: Madagascar, 731
- MIXED AND UNCLASSED, 125–6, 412–15, 726–32
  - Bacilli of: Localization of, in Carriers, **736**
  - Classification by Causation, 107
  - Clinical and Therapeutical, **732**
  - Cystic Dysenteric Colitis, **732**
  - Colon-Perforations due to Dysentery, **730**
  - Diarrhoea, Chronic, in Invalided Persons from D.E.I., **413**
  - Epididymitis in, **764**
  - Gastro-Enteritis in Sydney Children's Hospital, **413**
  - Incidence
    - Australia, **413, 728**
    - F.M.S., 513
    - Fez, **125**
    - Japan, **415**
    - Shanghai, **728** *bis*
    - South Africa, 512
    - West Indies, **125**
  - Infantile: Cerebral Symptoms, **415**
  - Medical Complications, **732**
  - Spirillary, **126**
  - Spirochaetal: *Vibriothrix zeulanica* in, **429** *ter*
  - Surgical Complications, **729**
  - Syndromes Cured by Anthelminthics, **731**
  - Titles of Unnoticed Papers, 128, 415, 732
  - Treatment, **126** *bis*
  - Trichomoniasis: Escomel Treatment, **414**

ENTERIC FEVERS IN THE TROPICS, 374–6, 747–8
- Associated with Undulant Fever, **379**
- Bacteriology
  - Bacilli associated with, Localization in Carriers, **736**
    - Soluble Toxins of, **724**
- Incidence
  - Dutch East Indies, 748 *bis*
  - Federated Malay States, 513
  - Mauritius, 513

Enteric Fevers in the Tropics—*cont.*
- Incidence—*cont.*
  - S. Africa, and Widal Reaction, 512
  - Tropics, **748** *bis*
- Titles of Unnoticed Papers, 376, 748
- Treatment by Lysed Vaccines, **906**
- Widal Reaction, Value of, in Inoculated Subject, **375**

- PARATYPHOID
  - *B. paratyphosus* B, Atypical, in Tucumán, **374**
- TYPHOID
  - Bacteriotherapy and, **374**
  - Diagnosis by Haemoculture, **374**
  - Differentiation from Malaria, 646–7
  - Friedberger's Reaction in, **39**
  - Incidence
    - Geographical
      - B.E. Africa, 510, 511
      - Madagascar, 374
      - Morocco, 375
      - South Africa, 747
    - Race : Negroes, **374**, 747
  - Prophylaxis
    - Antityphoid Vaccination, 374, 514
      - of Moroccan Natives, **375**
      - Oral, **747** *bis*
      - Preparation of Dried Vaccine, **595**

FEVERS, UNCLASSED, OF THE TROPICS, 388, 804–7
- Dengue-like
  - D.E.I., **805**
  - India, 383
- of Far East, **388**
- Guacarapá Fever, Typhus Fever of Venezuela, 17
- Kedani Fever, 388
- Kumaon (Typhus), **388**
- Pseudo-Typhus : Annam, **807**
- Serological Exams., **807**
- Seven-Day : India, **806**
- Typhus-like : Australia, **807** *bis*
- Unclassified Epidemic, with Rash : D.E.I., Soemba, 22
- Van der Scheer's
  - Differential Diagnosis, **807**
  - Nervous Symptoms, **388**

Gangosa
- Etiology, **608**
- Incidence
  - Haiti, **671**
  - Java, 608
  - Ladrones Islands, 608
  - Sumatra, 50
- Nomenclature, **608**

Goundou, 34 *ter*
- Histology, 34
- on Ivory Coast, 35

HEAT STROKE, 67–70
- Acclimatization or Immunity, **67, 70**
- in Chimpanzee : Fatal, **70**
- Immunity : Experiments, **67** *bis*
- Incidence
  - Basra : in British Troops, **69**
  - Tripoli : in Sucklings, **67**
- Treatment, Experimental, **67**

HELMINTHIASIS (*see also* **OPHTHALMOLOGY, TROPICAL**), **85–91, 857–64** (Critical Reviews), 203–61, 339–45, 615–44, 933–57
- Anthelmintic Medication : Present Status, **935**
- Anthelmintics : Carbon Tetrachloride and Ol. Chenop., **936** *bis*
- DISEASES, and Parasites associated with them
  - Diagnosis of, from Clinical Signs, **617**
  - Eosinophilia in, **251**
  - Helminthic Infections, *see also infra*
    - Common : Diagnosis and Treatment, **957**
    - Toxic Effects and the Endocrine Glands, **204**
  - Helminthological Investigations, **615**
  - Intestinal Parasitism, Helminthic Infections, or Worm Infestation in, and of
    - Gurkha Battalion, **934**
    - Japanese Students, **617**
    - Jerusalem, **933**
    - Mauritius, 514
    - Military Police : Rio, **616**
    - Natives, African : Cancer due to, 23
      - Belgian Congo, **934**
      - Nigeria, 509–10
      - South Africa, 511
    - Nematode : U.S.A., **203**
      - Human and Animal : Through Skin, **228**
    - Philippine Islands, **203**
    - Senegal, **615, 616**
    - Soldiers : Siam, **617**
    - Treatment, **627**
      - Anthelmintics: Recent Work on, **205**
      - Carbon Tetrachloride, **206** *bis*, **207, 628**

Helminthiasis—*cont.*
DISEASES—*cont.*
Intestinal Parasitism, &c.—*cont.*
Treatment—*cont.*
Ol. Chenop., Aural Disturbance after, 63–4, **64**
Toxicity, **63, 64**
ANKYLOSTOMIASIS
Anaemia in
Cause, **251**
Tropical, **642**
Anthelmintics: Chemical Composition and Therapeutical Value, **253** *bis*
Bibliography, **643**
Blood Count in, **251**
on Cacao and Sugar Estates: Epidemiology and Effect of Control Measures, **243**
Critical Survey, **638**
Diagnosis, **640**
Mass, of Ancylostome Infection, **947**
Dietetics, **639**
Domestic Chickens and Pigs as Spreading, **243** *bis*
Experiments in Infection of Monkeys: D.E.I.,21
Incidence, Geographical
Australia: Campaign against, **954**
Queensland, 345
Brazil, 1918–20, **951**; 1922, **953**
B.E. Africa: Lamu, **230**
British Guiana, 340
Ceylon, 342–4
Colombia, **642**
Ecuador, **639**
Federated Malay States, 56
French Guiana, **247, 640**
India: Intensity, in relation to Humidity, **640**
Calcutta: Report of Research Lab. on, **250**
Indonesia, **248**
Java, 638, 985
Batavia, **245**
Moyobamba, Peru, **247**
New Guinea, 954, 955
Nicaragua, 339–40
Panama, 339
Papua, 954
Penang, **641**
Porto Rico, 949, 950
St. Lucia, 340–1
Samoa: American, **955**
Seychelles, 341–2
Siam, 344
Trinidad, 242, 243, 244, 341, 949

Helminthiasis—*cont.*
DISEASES—*cont.*
ANKYLOSTOMIASIS—*cont.*
Incidence—*cont.*
U.S.A. (Army) and Morbidity, **248** *bis*
Venezuela: Depopulation due to, **246**
Parasites associated with
Ancylostoma
Detection by Plate Culture, **252**
Eggs, Cultured in Faeces; Breakdown Point and Intense Acidity, **951**
in Faeces: Counting Method, **950**
and Larvae, Conditions under which Developing, **949**
Number in Faeces and Number of Adults in Host, relation of, **951**
in Stools and Worms Harboured, Compared for Number, **249**
Larvae, Infective in Soil, Isolation Apparatus for; Position, Migration, Presence, Length of Life, &c., **242, 244–5**
Invasion into Tissue of Various Animals: Fate, **956**
Life-length Variations, in those from Different Persons, **950**
Unsheathed, **242**
Vertical Migration, **949**
and other Nematodes: in Filipinos, **639**
braziliense, and *A. ceylanicum*, **639**
duodenale, **246**
Secondary Anaemia due to: Treatment, **260**
Necator: Description, **949**
americanus-like in Pigs: Amazonas, **252,** 956
suillus, **949**
in Persons Cured 5 Years Ago, **640**
Pigs in relation to, **243, 956**
Prophylaxis, **640**
Control, **949**
Factors in, **249**
Investigations, **240**
Experiments: Japan, **246**
Hookworm Campaigns, **339** *sqq.*, **954, 955**

Helminthiasis—*cont.*
DISEASES—*cont.*
ANKYLOSTOMIASIS—*cont.*
Prophylaxis—*cont.*
Hookworm Campaigns—*cont.*
Rockefeller Foundation's, **339** *sqq.*, 642
and Soil Infection, **638**
Relation of, to Malaria, **56**
Schneider's Test in, **250**
Serum of : Haemolytic and Antihaemolytic Substances in, **252**
Treatment, **639, 640**
Betanaphthol, **642**
and Thymol, **642**
Carbon Tetrachloride, 206, 207, **256** *ter*, **641** *ter*, 642, **956**
Toxic Effects, **257**
Ol. Chenop., Action, Dangers, &c., **258** *ter*, **259** *ter*
Mass, **253, 254**
at Penang, **641**
Thymol : Death after, **259**
Vermifuges, Various, **255**
ASCARIASIS
Complement-Fixation Test in, **237**
Erythrocyte Resistance in, to Haemolytics, **237**
Incidence : Western Pacific, 7
Parasites
Ascaris (chiefly *lumbricoides*)
Development of, **237, 637**
Stages, in Liver Tissue, **947**
Disturbances due to, **238** *ter*
Eggs : Growth, Hatching, Infectiousness, **946** *bis*
Resistance, **946**
Experimental Infection with, **636**
Larval Wanderings, **236,944**
in Mice, **636**
Morphological Variations, **947**
Preservation outside Gut, **637**
Symptoms due to, **636**
of Pigs and Man : Experiments on, **235** *bis*
Recent Additions to Knowledge of, **235**
Surgical Conditions in, **238**
Treatment by
Combretum pilosum, **238**
Santonin, **239**
BILHARZIASIS OR SCHISTOSOMIASIS
Antigen in Complement-Fixation Test, **215**
Canine Infection, **221**

Helminthiasis—*cont.*
DISEASES—*cont.*
BILHARZIASIS—*cont.*
with Cutaneous Features, **212**
Early Indications of, **940**
Experimental Infection of Animals with Cercariae, **621**
of *Physopsis africana*, **621**
Fresh-Water Snails and, **216** *bis*, **218** ; *see also* Mollusc Hosts, *infra*
Incidence
Geographical
Arabia, **621**
Australia : Possible, **622**
Brazil, 941
British East Africa, **511**
China, **623**
Congo, Belgian, **218** *bis*, 512, 624, **939**
French, 941
Dongola Province, **620**
French Colonies, **619**
Guianas, the, **940**
Japan, **221** *bis*, 623, **942**
Mesopotamia, 941
Basrah, **939**
Morocco : Intermediate Host, **213**
Natal, 941
Philippine Islands, **623**
Portugal, **216, 217** *bis*, **218, 621** *bis*, **622**
Endemic Focus : Intermediary Host, **940**
Portuguese E. Africa, **216**
India, **216**
Senegal, **619**
Dakar, in Children, **939**
South Africa, **216,** 940
in Natives, **213**
Tunis, **619, 620** *bis*
Uganda, 941
West Indies, **219**
Occupational, 217
Pathology in Man, **622**
Personal Experiences of, **623**
RECTAL, 941
Rectal Papillomata in, **941**
Schistosoma (Bilharzia) associated with
Closely-Allied, Differentiation of, **941**
Mollusc Hosts, Actual and Possible, Various Lands (*see also* Fresh-Water Snails, *supra*) **213,** 511–12, **619** *bis*, 620 *bis*, **621, 622, 623, 939**

- **Helminthiasis**—*cont.*
  - DISEASES—*cont.*
    - BILHARZIASIS, &c.—*cont.*
      - Schistosoma—*cont.*
        - *bovis* and *mansoni*: Intermediate Hosts, **941**
        - *haematobium*, 940, **941**
          - Cercaria of, Excretory System of, **218**
          - Infection, Perineal Route, **624**
        - *japonicum*
          - Cercaria of: Biology, **943**
          - Development in Final Host, **220, 221**
          - Eggs, Influence on, of Physical and Chemical Agents, **222**
          - Infections in Japan, **942**
            - Treatment by Emetine and Tartar Emetic, 221 *bis*, **623**
          - and Intestinal Cancer, 214
          - Migrations in Man, **942**
          - Per Os Infection Experiments, **220**
        - *mansoni*, Cercaria of: Morphology, **220**
          - Ova in Stools, Detection of, **219**
      - Treatment, **939**
        - Tartar Emetic, 212, **213, 214** *bis*, **215** *ter*, **623, 624** *bis*, 845, **943**
      - URINARY: Palestine, **212, 213**
    - BOTHRIOCEPHALUS Pernicious Anaemia, **222, 223**
    - CLONORCHIASIS
      - Blood Feature in, 212
      - Incidence
        - Japan, **211** *quat.*, **212, 938** *bis*
        - Johannesburg, **210**
      - Parasite: *Clonorchis sinensis*
        - Life-Duration in Dogs, **618**
        - Life-History: Prevalence, **210, 211** *quat.*
    - ECHINOCOCCOSIS = Hydatid Disease, **227**
      - of Brain, Experimental, **226** *ter*
      - of Cerebral Ventricle, **228**
      - Haemoclastic Crisis following Cyst Puncture, **227**
      - Hepatic [in Hindu], **944**
      - Intracranial, in Senegalese, **228**
      - Prevention: Buenos Aires, **627**
      - Primary, of Bladder, Question of, **228**
      - Sand, Effect on, of X-rays, 226
      - Treatment by
        - Arsenobenzol Preparations, 227
        - Tartar Emetic, 845
          - Failure, **227**

- **Helminthiasis**—*cont.*
  - DISEASES—*cont.*
    - ELEPHANTIASIS, and *Onchocerca volvulus*, **632**
    - FILARIAL ITCH, **633**
    - FILARIAL THROMBOSIS of Lymphatic Duct, **631**
    - FILARIASIS AND MICROFILARIASIS
      - Drugs tested in, 5
      - Elephantiasis: West Pacific, 6
        - of Labium: [Siam], **233**
      - and Haemoptysis, **631**
      - Incidence
        - Age, 2
        - Geographical
          - Argentina: Tucuman, 631
          - British Guiana, 2
          - China, **231**
          - D.E.I., **631**
          - Hayti, 631
          - India, 630, 631
            - Puri, **230**
          - Japan, **232**
          - Nigeria, Northern, 630
          - Sierra Leone, 630
          - West Pacific Isles, **5, 6**
      - Mosquito-Spread, 6
      - Myositis in relation to, 27–9
      - Notes on, **630**
      - Parasites
        - Filaria and Microfilaria
          - Larva, n.sp., in Skin of Gold Coast Natives, **945**
          - Microfilariae in Blood, Common Complaints associated with, **630**
        - *bancrofti*
          - Action on, of "132," **945**
          - Distribution: D.E.I., **631** *bis*
          - and Japanese Mosquitoes, **233**
          - Periodicity, **233**
        - *immitis* in Dogs, Pathology of, 232
        - *Loa loa*
          - Development in Chrysops, 509, **632** *bis*
          - Dormant Infection, **233**
        - *tucumani*, **631**
      - Signs of, **630**
      - Statistics of, **230**
      - Treatment by Tartar Emetic, **231**
    - FLUKE INFECTIONS
      - Snail Destruction and, **207**
    - *GNATHOSTOMUM SPINIGERUM* Infection in Man: Siam, **629**
    - GUINEA-WORM INFESTATION
      - Extirpation of Parasite after X-ray Location, **234**

- **Helminthiasis**—*cont.*
  - DISEASES—*cont.*
    - GUINEA-WORM INFESTATION—*cont.*
      - Treatment by
        - Antimony, Orally, **635** *bis*
        - Sugar, **946**
    - HOOKWORM, *see* ANKYLOSTOMIASIS, *supra*
    - ONCHOCERCIASIS
      - Dermal, **234**
      - Incidence
        - Congo, Belgian, 632
          - French, **633**
        - Guatemala, **633**
      - Parasite: *Onchocerca volvulus*, **632**, 945
    - OXYURIASIS, **637**
      - Parasite
        - *Oxyuris vermicularis*, and Appendicitis, **637**
      - Treatment by
        - Aluminium Subacetate, **239**
        - *Combretum pilosum*, 238
        - Salvarsan, **638**
    - PARAGONIMIASIS
      - Immunization Experiments, **209**
      - Incidence
        - Japan, **211** *bis*
        - Peru, 209
      - Parasite
        - *Paragonimus westermanii*
          - First Intermediate Host, **209**
          - Life-History, Pathogenicity, Prevention, **209** *quat.*, **210**
      - Prophylaxis, **210**
      - Treatment by Emetine Hydrochloride, **210**
    - PSEUDO-MENINGITIS, Helminthic, **204** *bis*
      - Ascaris-caused, **238**
    - RHABDITIS INFECTION, **229** *bis*
    - SCHISTOSOMIASIS, *see* BILHARZIASIS, *supra*
    - STRONGYLOIDOSIS
      - Due to *S. stercoralis*: Anaemia due to, **629**
      - [India], **629**
      - Parasites: *Strongyloides*
          - Detection by Plate Culture, **252**
        - *intestinalis*: Biology: Larvae, **229**
          - Haematuria due to, **229**
    - TAPEWORM Infestation: Is Neosalvarsan a Remedy for? **628**
      - and Bladder Worm: Suppression: S. Africa, **625**
      - Identification Method for Tapeworms, **226**
      - Treatment by Betanaphthol, **944**

- **Helminthiasis**—*cont.*
  - DISEASES—*cont.*
    - TRICHINIASIS, Epidemic: Erlangen, **239**
  - PARASITES, *see also under the various* DISEASES, *supra*
    - Found in
      - British Guiana, 935
      - North China, **934**
      - West Pacific, 7
    - Hepatic: Dakar, **207**
    - Ova, Collecting
      - Concentration Method, **617**
      - Gauze Filters for, **205**
      - New Method, **617**
    - Prevalent during the War, **203** *bis*
    - Rare Human: Philippines, **203**
  - Genera and Species Named
    - *Dibothriocephalus latus*, Experimental Infection with, of Cyclops of Lake Lucerne, **944**
    - *Echinochasma perfoliatus*, **208**
    - *Fasciola hepatica*, Causing Muscle Abscess, **937**
    - *Fasciolopsis buski*
      - Cercaria, Encysted of, Resistance of, **936**
      - Life-Cycle, **618**, **936**
      - Ova: Development, Effect on, of Temperature, **618**
    - *Heterophyes* in Egyptian Mullet, **937** *bis*
      - *nocens* n.sp., **208** *bis*
    - *Hymenolepis diminuta*: Japan, **626**
        - in Man, **224** *bis*
      - *nana*: Life-History, **625**
        - and *H. fraterna*: Controverted Points, **625** *bis*
        - and *H. murina*: Development, **626**
    - Nematode(s) in Pigs, **229**
      - Technique: New Methods, **628**
    - *Oesophagostomum apiostomum*: Nomenclature, **239**
    - *Sparganum mansoni*, in
        - Fowls, **627**
        - Human Testicle, **627**
      - Morphology, **223**
      - Origin in Cats, **224**
    - *Stamnosoma armatum* n.g., n.sp., in Fresh-Water Fish, **208**
    - Strongylidae: Classification, **239**
    - *Taenia nana*, Egg, Resistance of, **225**
      - *saginata* (?)
        - Biology, **943**
        - Eggs: Resistance, **225**, **943**

Helminthiasis—*cont.*
PARASITES—*cont.*
Genera and Species Named—*cont.*
Taenia nana—*cont.*
saginata (?)—*cont.*
Infection: Biological Diagnosis, **224**
solium, Meningitis due to, **626**
Trematode(s)
Hepatic, and Cancer, **214**
Indo-China: Life-Cycle, **618**
n.sp.: Japan, **208** *bis*
Parasitic to Fresh-Water
Fish: Japan, **208** *bis*
Molluscs: India, **207**
S. African Larval, and Intermediate Hosts, **938**
Prophylaxis: Septic Tank in Tropics, **935**
Titles of Unnoticed Papers, 260–1, 643–4, 957

Hookworm Campaigns, *see under* ANKYLOSTOMIASIS, *under* **HELMINTHIASIS**

Influenza
Differential Diagnosis, **807**
Epidemic, Filter-Passing Organism in, **607**
Incidence
French Colonies (1918–19), **604**
Malta: Bacteriological Exams., **902**
New Caledonia, **45,** 607
South Africa, 607
Necropsies, 41, 42

JAPANESE RIVER FEVER (Tsutsugamushi Disease), 386, 809–10
Causal Agent, **809**
Relation to Blood Constituents, **810**
Description, **386**
Incidence
Formosa, **386**
Japan, 386
Insect Transmitting, 386
Weil-Felix Reaction in, **810**

JAUNDICE, INFECTIOUS, 140–4, 582–4, 883–6
in Black Persons, **659**
Experimental in
Guinea-Pigs: Blood Exam., **586**
Kids, **141**
[Fatal Case], **141**
Incidence
Buenos Aires, **584**
Congo, Belgian, 139
French (Brazzaville), **142, 582**

Jaundice, Infectious—*cont.*
Incidence—*cont.*
D.E.I., **583** *bis*, **884** *bis*
London, **140**
Leptospira(s) (Spirochaetes), in
Blood, **884**
Unclassed Tropical Fevers [D.E.I.], **583** *bis*
Urine, **884**
Free-living in Water: Pathogeny, **143**
Pathogenic and other, **885**
icterogenes: Relation of, to Free-living Water Spirochaetes, **582**
icterohaemorrhagiae, **388**
Morphology: Reproduction, **884**
in Rats: England, Warsaw, Michigan, **584** *bis*, 886 *bis*
Meningitis in Children, believed to be Spirochaetal, **584**
Prophylaxis, **141**
Spirochaetosis icterohaemoglobinurica, **883**
Titles of Unnoticed Papers, 147
Treatment by Serotherapy, **141**

Juxta-Articular Nodules, 170, 177, **288** *bis*

KALA AZAR (Leishmaniases, All Forms), 92–105, 566–77, 865–76, 928
Adrenals, Possible Function of, in, **869**
Aldehyde Test, **570**
Antimony-Fast, **577**
Antimony Resistance and Intolerance in, **571**
Blood Infection, 868
Blood Sugar in Bengalese in, and in Health, **573**
Bodies in *Cimex rotundatus*: Assam, **104**
Canine: Virus of, Maintenance in Lab. Dogs, **573**
Clinical Picture: Analysis, **567**
Complications
Pulmonary Aspergillosis, **49**
Unusual, **869**
DERMAL OR CUTANEOUS (Aleppo Button, Biskra Button, Delhi Boil, Oriental Sore, Tropical Sore), **568, 875, 876**
American
Incidence
Brazil, 574, **576**
Venezuela, **575**
Pathology, **574**
Treatment by "Bayer 205," **576**
Appendicitis Attributed to, **575**

Kala Azar—*cont.*
- DERMAL OR CUTANEOUS—*cont.*
  - Case with Three Lesions, **874**
  - [Delhi Boil in 1860], **576**
  - Etiology, **868**
  - Incidence
    - Algeria, 876 *ter*
    - India, **576**
    - Italy, 874, 875
    - Mesopotamia, **104,** 876
      - Basra, 874
    - Rio de Janeiro, **575**
    - Sahara, **574**
    - Syria, 575, 873, 876
    - U.S.A., **577**
    - Yucatan, **577**
  - Inoculation of, **873**
  - Resembling Lupus, **574** *bis*
  - Three Cases, **874** *bis*
  - Titles of Papers briefly Noticed, 105
  - Treatment by
    - Antimony Salts, **576**
    - Diathermy, **876**
    - Medical Means, **875**
    - Phosphorated Oil, **576, 874**
    - Stibenyl: Cure, **577**
- Diagnosis by
  - Blood Culture, **98**
  - Bone-Marrow from Sternum, **97**
    - Removal of Marrow, **570** *bis*
  - Serum Reaction, **98**
  - Spleen and Bone Puncture, **97**
- Etiology, **868**
- Experimental, Acute: Pathology, **872**
- Fatal Bleeding in, **577**
- Formol-gel Test, **98** *bis*, **99** *bis*
- Globulin Opacity Test, **872**
- Incidence
  - Egypt (indigenous), **568**
  - France, **569**
  - India, 95, 566, 571, **573**
    - Assam, 94, **95, 104**
      - Nowgong, **865**
    - Bengal, **865**
    - Madras, **865** *bis*, **872**
    - Shillong, **869**
  - Spain, **99** *bis*, **568**
  - Sudan, **867**
  - Tunis, **96**
  - U.S.A., **577**
- Indian: Leishmania in Intestinal Tissues, **95**
- Insects and, 92–3 *et passim*, **95,** 873
- Interesting Cases, **870**
- Kala Azar, **577** *bis*
- Leishmania (Herpetomonas) Associated with All Forms
  - Cells containing, **577**
  - Culture Media
    - N.N.N., **104**
    - Yoshida's, **103**

Kala Azar—*cont.*
- Leishmania, &c.—*cont.*
  - Flagellate Forms, Reversion of, **103**
  - and Insect Flagellates, Relationship between, **867**
  - *donovani* in
    - Peripheral Blood, **572**
    - Urine, **868**
  - *tropica*: Biology, **573**
- MEDITERRANEAN OR INFANTILE, **875**
  - Action in, of Leucocytic Agents, **869**
  - Cholesterin Diminution in, **100**
  - Diagnosis: Brahmachari Re-action in, **570**
  - Incidence
    - Dutch East Indies, 875
    - France, **569,** 571
      - Marseilles, **875**
    - Messina, **568**
    - Spain, **99** *ter*
  - Spleen Changes in, **99**
  - Treatment: Effect on Blood and Blood-forming Organs, **569**
    - Various Means
      - Tartar Emetic, 870, **872**
      - Tartras-Kalico-Stibicus: Cure, **875**
- Onset, Season of, **567**
- Problems, **92** *bis*
- Research Work
  - Calcutta (1921), **93**
  - Shillong (1922), **566**
- Review of Subject, **577**
- Sequelae: Dermal Leishmanoid, **568**
- Splenomegaly and, in Egyptians, **568**
- Studies on, **868**
- Transmission, **96, 866** *bis*, **873**
- Treatment by
  - Antimony Compounds, **102**
    - Chemotherapy of, **568**
    - Toxicity of, **871**
  - "Bayer 205," **102, 572**
  - Stibenyl, **100,** 101, **571** *bis*
  - Tartar Emetic, 870, **872**
    - [in Albolene: Intramuscularly], **101**
    - Cures, 872
      - Evidence of, **871**
    - Intravenously, **101**
    - at Shillong, 869
    - and Stibiacetin, 100
    - in the Sudan, **867**
- Wassermann Reaction, Positive, in, **873**

LABORATORY METHODS, 588–600
- Bacteriological and Lab. Technique, **600** *bis*
- Blood Count: Improved Method, **588**

Laboratory Methods—*cont.*

- Histological Technique, **599**
- Indol and Vosges-Proskauer Tests for Lactose-Fermenting Organisms, **596**
- Lymphoidocyte and Turk Cell, **593**
- Staining of, and by
  - Amoeba: Iron Haematoxylin, **592**
  - Benian's "Relief" Stain: Fallacy in Use where Congo-Red is Used, **592**
  - Blood
    - Giemsa's Stain, **590** *bis*
    - Vital, **590**
  - Iron Haematoxylin, **592** *bis*
  - Malaria Films, **589**
  - Spirochaetes: Silver Agar Method, **591**
- Syringe for Blood Transfusion, **592**
- Thick Film Method: Pros and Cons, **588** *bis*
- Vaccine(s)
  - Dosage: Single *v.* Fractional, **595**
  - Dried, for Typhoid and Cholera: Preparation, &c., **595**
  - Old: Dosage Increase to make Use of, **596**
  - Production, Large Scale, **593**

LEPROSY, 148–65, 480–96, 821–34

- Address on, by Rogers, **148**
- *B. pyocyaneus* Infection Simulating, **487, 834**
- Bacteriology, **154**
  - Bacillus of: Cultivation, **494**
    - Acid-Fast, "Defatting" of, **828**
  - Diphtheroid Bacillus in, **154**
- Calcium and Phosphorus Elimination in, **492** *bis*
- Care of Lepers [U.S.A.], **484**
- Case of, **154**
- Cerebrospinal Fluid in Lepers, **493**
- Chaulmoogra Oil
  - Derivatives: Manufacture, **160** *bis*
  - Ethylic Esters of: Simple Method of Preparation, **923**
  - Sources, **828**
- Cholesterinaemia in, **493**
- Complement-Fixation Tests, **832** *bis*, 833
- Cutaneous Innervation, **824**
- Diagnosis, **491,** 834
- Dissertations on, **488**
- Early Lesions, **157**
- Epidemiology, **496**
- Erythrocyte Resistance, **834**
- Etiology, **824**
- Formol-gel and Hecht-Bauer Reactions in, **761**
- Histological Changes, in Liver, Spleen, and Spinal Cord, **495** *bis*

Leprosy—*cont.*

- Human and Rat, **825**
- Incidence
  - Age: Children, **157, 480**
  - Geographical
    - Algeria, **823**
    - Basutoland, 165
    - Brazil, **482** *bis*, **823**
      - Pará, **150**
      - Rio de Janeiro, 480 *bis*
    - Calabar, 491
    - Cameroons, **163, 822** *ter*
    - Colombia, Problem of, **481** *bis*
    - Dahomey, **150**
    - D.E.I., 486
    - Egypt, 164
    - England, 154
    - Fiji, 162
    - France, **484**
    - French Colonies, **152**
    - Gold Coast, 165
    - Hawaii, **150, 151,** 152, 484
      - Chart, 153
    - Italy, 484
    - Libya, **277**
    - Mexico, 154
    - Nigeria, 509, 510
    - Norway, 483
    - Oesel (Esthonia), **149**
    - Philippine Islands, **831,** 832
    - Sardinia, **483**
    - South America, 152, 164, 495
    - Sudan, 164, **486**
    - Tanganyika, **483**
    - U.S.A., 152, 484
    - West Indies, 3
    - World-distribution, **480, 821**
    - Yunnan, 15
- Infection: Probable Mode (*table*), **148**
- Is it Increasing? **152**
- in Lepers' Children, **157,** *tables*, 158–9
- Leprous Hyperostoses of Leg Bones, **487**
  - Keratitis Punctata, **486**
  - Reactions induced in Lepers by Smallpox Vaccination, **485** *bis*
- Long Incubation, 154
- in relation to Meteorology, **821**
- Nerve Cases, **834**
- Nodular, Atypical: Sudan, **486**
- Ophthalmological Exam. of 350 Lepers, **486**
- Parole System [Hawaii], **484**
- Primary Manifestations, **485**
- Prophylaxis: Various Means: Various Peoples, 3, **148** *passim*, 151 *bis*, **482, 483, 484, 824**
- Rat, is it Transmissible to Man? **158**
- Sachs-Georgi and Wassermann Reactions in, **159, 834**

Leprosy—*cont.*
- Serological Researches, **833**
- Titles of Unnoticed Papers, 165, 496
- Transmission or Spread, **148**
  - From Initial Lesions, **826**
  - Probable Mode of, **821**
- Treatment, 149, **151, 162, 488, 491, 492, 827**
  - at Cameroons Leproseries, **163, 822**
  - and Cure, **487**
  - and Prognosis, **162**
  - Review of Recent Literature on, **834**
  - Various Means
    - Antimony, **491,** 513, 845
      - and Sulphur, **165**
    - Cantharides, 492
    - Chaulmoogra Oil and Derivatives, 149, 150, 151, 160, **161, 162,** 163, **488, 489** *bis*, **827, 828** *ter*
    - Copper Preparations, **490,** 491
    - Dietetic, **831**
    - Eparseno, **164** *bis*
    - Moogrol, 510
    - New Medicaments, **491, 830**
    - Trépol, **831**
- Unusual Case, **154**
- Wassermann Reaction in, **832**
- X-Ray Appearances of
  - Hands and Face, 829 (*ill.*)
  - Hands and Feet, **154** (*ill.* 155)

MALARIA, 291–308, 551–6, **771–9** (Critical Review), 958–78
- Acute Yellow Liver Atrophy, and Salvarsan, **299**
- Addison's Syndrome and, **564**
- "Aldehyde Test" in, **975**
- Anisocytosis in Malarial Patient, **976**
- Ankylostomiasis in relation to, **56**
- Anopheles and: Bavaria, **305** *bis*
  - Palestinian, 961
- Avian, Relapse in, Light as Cause, **302**
  - Treatment by Quinine, &c., **303**
- *B. coli*-caused Fever Simulating, **977**
- in relation to Blackwater Fever, *see under the latter head*
- Blood in, and from
  - and Blood Picture, **976** *bis*
  - Preservation, &c., of, for Treatment of G.P.I., **975**
  - Sedimentation Rate, **562**
- in Chimpanzees: Sierra Leone, **558**
- Cinchona from Java, 556
- Cinchona Febrifuge: India and Java, 301
- Chronic, **294**
  - Radiostimulation in, of Spleen, **307**

Malaria—*cont.*
- "Colloidal Shock," Phenomena of, **563**
- Complement in, **303**
- Complement Fixation in Tuberculosis in relation to, **201**
- Congenital: Colorado, **559**
- Dengue *versus*, **299**
- Diagnosis
  - Differential, of Surgical Affections of Abdomen and, **966**
  - Thin Films, **564**
- Diagnostic Sign, **564**
- Double Infection, or Parthenogenesis, **977**
- Early Paper on, Reviewed, **975**
- Epidemic regarded as: Portuguese India, **556**
- Epidemiology: Analysis, **298** *ter*
- Epididymitis in, **764**
- Epilepsy, possibly related to, **307**
- Experimental: Observations, **295**
- Eye Complications, **985** *bis*
- Films: Staining, **589**
- Formol-gel Test in, 975
  - and Hecht-Bauer Reactions in, **761**
- Historical Review, **555**
- Incidence
  - Age, 18
    - Children, **554** *bis*
    - Boy of Three, **967**
  - Geographical
    - Australia, **961**
    - Bamako: Endemic Index, **292**
    - Bavaria [Decrease], **305** *bis*
    - Bechuanaland, **967** *bis*
    - Belize, **293**
    - Brazil, 552–3
      - Rio de Janeiro, **557**
    - British East Africa, 510
    - Congo, Belgian, 553
      - Elizabethville: Endemic Index, **959**
      - Léopoldville: Index, and Quinine Prophylaxis, **959**
    - Corsica, **293, 977**
    - D.E.I., **556, 974** *bis*
      - Magelang, **293**
    - East Africa, 296
    - F.M.S., 457, 513, **556**
      - Quinine-Resistant, **301**
    - France, Autochthonous, **967, 977**
      - in Repatriated Persons, **294** *bis*, 554
    - French Niger, **555**
    - French West Africa, in Adult Blacks: Parasitology &c., **960**
    - Germany, **558**
        - Diagnosis: Treatment, **968**
      - Berlin, 297, **564**

- **Malaria**—*cont.*
  - Incidence—*cont.*
    - Geographical—*cont.*
      - Gold Coast, 18–19
      - Haiti, in Marines, **563**
      - Holland, 965
        - North, **962**
      - India: Prediction of Epidemics, **555**
        - Bengal, **292**
        - Sawantwadi State: Survey, **292**
      - Italy, in the "Southern Problem," **294**
        - Rome, **564**
      - Mediterranean Shores, **294,** 977
      - Mesopotamia: Quinine-Resistant, **302**
      - Morocco: Association with Amoebiasis, **908**
      - Ouagadougou, Upper Volta: Dry Season, **976**
        - Endemic Index, **976**
      - Palestine
        - Antimalarial Advisory Commission's Proceedings (1922), **960**
      - Peru, **972**
      - Philippine Islands, **553,** 554
      - Porto Rico, 646–7
      - Portuguese E. Africa: Epidemiology, 1901–20, **958**
      - Russia, **564,** 961 *bis*
        - Pandemic, **557**
        - Saratov, **559** *ter*
      - Senegal, **555**
        - Dakar: Prevention, **307**
        - Kaolack, **960**
        - Various Seasons, **291, 292**
      - Spain, Câceres: Campaign against, **962**
      - Syria, Beyrouth: Campaign against, **977**
      - Transvaal, 564, 958
        - Veldt
          - Middle and High, **976**
          - Middle and Low, **291**
      - U.S.A. 552, **559, 966,** 967
        - Distribution indicated by Mortality Reports, **963**
        - Colorado, **559**
        - Missouri, **966**
          - S.E., Problem of, **963**
        - San Francisco, **963**
        - Yugo-Slavia, **557**
    - Race: Negroes, **553**
  - Influence of, on Wassermann and other Reactions, 31
  - Inoculation of, in Treatment of G.P.I., **973, 975, 977**
    - in D.E.I., **974** *bis*

- **Malaria**—*cont.*
  - Latent
    - Activation by
      - Physical Agents, **560**
      - Salvarsan, **299** *quat.*, 307
    - Provocatives in Diagnosis, **295**
  - Malaria Index in French African Colonies, **555** *bis*
    - Stations [Russian], **961** *bis*
  - Malarial Polyarticular Rheumatism, **977**
  - Masked, **559**
  - Mosquitoes, Malarial, Control of, in Rice-fields, **305**
  - Naval History of, in the War, **964**
  - Paroxysms: Pathogeny, **563**
  - Pigment, Iron Reaction in, **563**
  - Plasmodia
      - Biology, **296**
      - Phagocytosis of, **559**
      - Pigment in, **303**
      - Situation in relation to Erythrocyte, **302**
      - Unity or Plurality, 294, **296**
    - *falciparum*, Infection, *see* Sub-Tertian, *infra*
      - Morphology, **297**
    - New (*P. ovale*), **296**
  - Polyneuritis, Severe Malarial, **976**
  - and Pregnancy, **307**
  - Prophylaxis (*see also* Research and), 564
    - Antimalarial Measures, Various Places and Methods, **305, 307, 960, 961** *bis*, **962** *bis*, **977** *bis*
      - American Research Lab., and Survey Section, Palestine, **960**
    - Quinine, **959**
    - Sanatoria in Malarial Regions, **964**
  - Quinine, Does it Act on Schizonts of *P. vivax* in Intraglobular Stage? **971**
  - Quinine Intolerance, **59, 60, 61**
    - Blood Transfusion for, **61**
  - Quinine-Resistant, **301, 302**
    - Iodine for, **562**
  - Quinine Tests, Simple, **561**
  - Relapses, **307**
    - Post-operative, 564, **976** *bis*
  - Research and Prophylaxis: F.M.S. and D.E.I., **556**
  - Sero-reactions of Syphilis in, **975**
  - Spleen and Blood Exam. in, **966**
    - Puncture Findings in, **965**
  - Splenic Index, **551** *quat.*, **553**
  - Splenomegaly, Excessive: Complications, **553, 967, 977**
  - Sub-Tertian
    - Diagnosis, **298**

Malaria—*cont.*
Sub-Tertian—*cont.*
Incidence
Germany: Relation to Salvarsan, **558**
Moscow, Indigenous, **564**
Treatment, **298**
Wassermann Test Positive in Fatal Case, **564**
in Surgery, **564**
Tertian, Benign
[Bechuanaland], **967** *bis*
Blood- and Parasite-Counts in, **965**
Titles of Unnoticed Papers, 308, 978
Transmission
Artificial, Lessons of, **974**
Pfeiffer's Theory on, **976**
Treatment, **564**, 968, 969 *bis*
in Malarial Valleys: Peru, **972**
Studies in, **968, 969** *bis*
Various Methods
Alkali with Quinine, **300**
Bad Kissingen [Chronic], **302**
Cinchonine, **561, 977**
for Infants, **971**
Harmala Alkaloids, **973**
Iodine, for Quinine-Resistant Cases, **562**
Quinine, 513, 968, 969 *bis*, 972
Abuse in Young Children, **554**
and Arsenic Alternatively, **560**
Compressed, **306** *quat.*, **969**
Excretion, **560**
Dosage for Infants, **301, 970**
Intramuscularly, **970**
with Magnesium Sulphate and Alkali, **971**
in Pregnancy, **560, 972**
Rectally, **970** *bis*
Radiotherapy, **562, 972**
of Spleen, **973**
Silver-Salvarsan, **561** *bis*
and Sulfoxylat, **561**
Standard, **970**
Visceral, **976**
with Unusual Symptoms, **300** *bis*

***MEDICAL ZOOLOGY,** 265–276; 418–421; 437–479; 780–802. *See also* Haemogregarines in Man, 527–550; 855
Acari, as Cause of Disease, 473 *ter*
Acariasis, from Grain, 473, 800
Accra, Mosquitoes and Rat-fleas of, 19
Adder-bite, Cases of, 475 *bis*
Aëdes calopus [see *Stegomyia calopus* and *fasciata*]
variegatus, Breeding-places, 6
Alofia (Linguatulida), Diagnosis, 273

Medical Zoology—*cont.*
Amoeba of Asclepiads, 450
of Latex and Experimental Liver Abscess, 787
of Lettuce, 450
Amoebae and Emetine, 438
of Euphorbias, Experimental Inoculation of Animals, 450
in Lymphogranuloma, 35
Amoebiasis, Rôle of the Helminths, 437
Animal Pests, Sanitary Control, 455
Anopheles bifurcatus, Egg Resistance, 793
breeding in *Pistia*, 457
Anopheles, Breeding-places, Character of Water, 265
Breeding Seasons, in F.M.S., 457
Classification of American Larvae, 458
claviger, in Caceres, 793
Control, Biological, 458
Duration of Malarial Infection, 266
Food Preferences, 789, 790
New Species of, 459, 793
of El Salvador, 793
Preferential Feeding, 789
Roubaud's Theory in Holland, 459
venezuelae suppressed, 793
Zoophilism, 266, 459, 790, 791
Anophelines of Siam, 793
Anophelism and Paludism, Beirut, 791
without Malaria, 790
Anticlapine Serum, 476
Antiscorpion Serum, 476
Antivenene, in Dutch E. Indies, 478
Aploactis, Wound by Spines of, 421
Armillifer, Diagnosis, 274
armillatus, Infestation of Man by, 475
brumpti n. sp. (Linguatulid), 418
Asthma, due to *Pediculoides*, 473
Bacteria in Dog Faeces, 455
Balantidium, Dysentery, 127
Neuromotor Apparatus, 788
Species and Specific Hosts, 789
blattarum n. sp., 479
coli, Budding of, 449
and Pernicious Anaemia, 449
ovatum n. sp., 449
suis n. sp., 788
Beetle Preying on Mosquito Larvae, 793
Biological Survey of Texas, 455
Birds, Australian, Parasites of, 802
in Mosquito Control, 461
Blastocystis, Cultivation and Species of, 454
Affinities of, 453
Question of, 786
hominis, in Chronic Diarrhoeas, 786
Blood Parasites, Search by Triple Centrifugation, 439
Blowfly, *see* Calliphora

---

* The MEDICAL ZOOLOGY Section of this Index has been prepared by Colonel. A. ALCOCK, and a different system from that adopted for the other Sections has been followed.

Medical Zoology—*cont.*
Breeding-places of Mosquitoes, 265, 456, 458, 460, 791
Bullinus and Physa in Mediterranean Basin, 420
Cabbage Bug, Experiments with, 787
Calliphora, Resistance of Eggs and Larvae in Intestine, 466
Canine Faeces of London Pavements, 455
Caranx latus, Poisoning by, 420
Carriers and Microscopic Parasites, 437
Cattle in Anopheles Control, 266, 791
  in Tsetse-fly Control, 268, 467, 468
Ceratopogoninae in Accra, 461
  Attacking other Insects, 795
  West African, Part 2, 461
Cestode Larva Parasitized by Microsporidium, 449
Chara, Mosquito Larvicidal Species of, 792
Charcot-Leyden Crystals in Coccidiosis, 447
Chiggers, Infestation by, 797
Chrysomyia, Myiasis by, 465, 796 *bis*
Chrysops and *Loa loa*, 267, 509
Cimex rotundatus, Bodies observed in, 104
  Salivary Glands, &c., 474
Coccidia of Aquatic Birds, 788
  The Discovery of the, 447
Coccidiosis of Cats and Dogs, 785
  in Man, 447, 448
Cockroach, Balantidum of, 449, 479
  Rôle of, in Disease, 471
Coconut Palms, Mosquitoes Breeding in, 792
Colorado Beetle, Supposed Poisonous Qualities, 472
Control of Insanitary Animal Pests, 455
Coprology, Microscopic, 456
Crab Louse, 474, 798
Creeping Myiasis in Russia, 467
  Pseudomyiasis at Tamatave, 796
Crithidia in *Lyperosia thirouxi*, 444
Culicidae, Classification of, 792
  Genitalia of, 792
  Mites on, 792
  Reared from Coconut Palms, 792
  Salivary Pump of, 792
  of Venezuela, n. spp., 793
Culicines of India, Revision, Part I, 461
Culture Diagnosis of Intestinal Flagellates, 440
  of Flagellates in Latex, 450
  of *Herpetomonas ctenocephali*, 440–1
  Media for Leptomonas, 445 *bis*, 788
    for Protozoa, 788
Cynocephalus (*Papio sphinx*), Haemogregarine of, 447, 540

Medical Zoology—*cont.*
Dermatitis due to Moths, in Japan, 472
  caused by Larvae of Lepidoptera [in South America], 801
  caused by Liparid Moth, in China, 800
Dermatobia hominis, Egg Porters of, 796
Dermatophilosis, 797
Destruction of Deer in New Forest, Unforeseen Effects, 268
Diesingia [Linguatulida], Diagnosis, 273
Dipterous Larvae, Nutrient Agar for Rearing, 457
Dog Faeces, Organisms in, 455
Dormouse, Plasmodium of, 445
Ear-tick Disease, 799
Echidnophaga gallinacea, in French West Africa, 20
Eimeria oxyspora, Human Infection, 448
  snijdersi = *E. oxyspora*, 448
Embadomonas sinensis, Notes on, 444
Emetine, Action on Protozoa, 438
Entamoeba coli, Mitosis in Cysts, 787
  histolytica, Normal Resistance of Intestine, 437
  of Monkey (*Macacus rhesus*), 787
Enteromonas caviae n. sp., Growth and Culture, 788
Euproctis flava (Moth) Dermatitis, 800
Eye-fly, Pseudotracheal Teeth, 461
Fish, in Control of *Stegomyia fasciata*, 267, 460
  "Mosquito-larvivorous," in Australia, 791
  Poisoning by, on U.S.S. *Florida*, 801
    in Virgin Islands, 420
  Venomous Wounds by, 421 *bis*
Flagellates of Cabbage Bug, Experiments, 787
Flagellates, Culture Methods, 440, 441, 445, 450–1, 788
  of Insects, 270
    Pathogenic to Vertebrates, 784
  New, in Human Intestine, 444
  of Plants, 450
Fleas, of Accra, 19; of French West Africa, 20
  Repelled by Sheep, 798
  See also Rat-fleas
Flies, *see also* Housefly *and* Myiasis
Flies, Attraction by Fermenting Substances, 463
  Chemotropic Reactions of, 463, 464
  Distance of Flight, 269
  and Infectious Disease, 462
Fumigants for Phlebotomus, 461
"Gastrophilus," Myiasis due to, 467
Genitalia of Mosquitoes, 792
Giardia
  Action of Stovarsol on, 784
  of Man and Tadpole, Comparative Study, 443

Medical Zoology—*cont.*
Giardia—*cont.*
  of Man, Rabbit, and Dog, Relations of, 443
Giardia intestinalis, Staining Varieties of, 788
Giardiasis, Human, Criticism of Rodent Origin, 442
Glossina, *see also* Tsetse-flies
    Artificial Breeding-places, Report on, 794
    Control, 268, 467–8, 470–1, 794
    Geographical Distribution, 471
    Parasites of, 470
  morsitans, 467, 468, 469, 794
  palpalis, 467, 468, 469, 794
  swynnertoni, Habits of, 469
    n. sp. described, 470
  schwetzi, New Observations, 470
  tabaniformis, New Observations, 470
  tachinoides, 468, 469, 794
Grahamella, in Dormouse, 445
  in Macacus, 788
Grain, Acariasis from, 473, 800
Haematozoa of Wild Rats, 454
Haemogregarina of Baboon (*Papio sphinx*), 447, 540 ; *boum*, 541 ; *bovis*, 541 ; *cynomologi*, 539 ; of Dimand, 531 ; *elliptica*, 534, 535 ; *equatorialis*, 446, 539, 855 ; *gallica*, 447, 537 ; *hominis*, 530 ; *inexpectata*, 446, 531
Haemogregarines in Man, 527–50 ; 855
  and Megalospleny, in Africa, 446
  and Pernicious Anaemia, in France, 446
  and Sarcocystis Spores compared, 529
Haemoproteus columbae, Spontaneous Disappearance of Infection in Pigeon, 445
Helminth Ova in Dog Faeces, 455
  Parasites of Wild Rats, 454
Helminths of Western Pacific Islands, 7
Hereditary Transmission of Microbes, 471
Herpetomonas ctenocephali, Life-history and Reactions, 440
  Culture of, 440, 451
Hippoboscidae, New Species of, 795
House-fly, Attraction to CO_2, 464
  Biology (in Australia), 462
  Biology under Aseptic Ménage, 463
  Breeding in Cow-dung, 458
  Chemotropism, 463, 795
  Distance of Flight, 269
  Duration of Life, 269
  Entamoeba, &c., harboured by, 509
  Fecundity and Longevity, 464
  Oviposition in Panama, 463
  Maggots of, Duration of Infectivity, 269
Ictonyx zorilla, Plasmodium, 446

Medical Zoology—*cont.*
Insect Flagellates and Leishmaniasis, 270
  Pathogenicity to Vertebrates, 784
Insect " Nurseries " in W. Africa, 456
Intestinal Parasites in the Philippines, 781
Intestinal Protozoa, Effect of Carbon Tetrachloride, 784
  Effects of Changes of Diet of Host, 438, 783
  Relation of H-ion Concentration to, 781
  in Malaya, 781
  in 382 Patients in New York, 437
  in the Philippines, 781
  in Porto Rico, 780
  in Western Pacific Islands, 7
  of Wild Rats, 454
  Untrustworthy Statistics, 437
Iodamoeba in Pigs, 7, 113, 787
Isospora of Man, Status of, 785
  belli, new name, 786
  hominis, Infection in S. Africa, 448
    Name restricted, 786
    Pathogenicity in Nigeria, 447
Ixodidae, Symbionts of, 474
Jarrina n. gen., Coccidiidae, 788
Kala Azar, Relation to Biting Insects, 95
  See also under Insect Flagellates, *and* Leishmania
Kiricephalus (Linguatulida), Diagnosis, 273
Lamblia, *see* Giardia
Larvae of American Anopheles, 458
Lathrodectes mactans, Bite of, 801
Leiperia (Linguatulida), Diagnosis, 273
Leishmania, Cultivation of, 93, 103
  Possible Insect Carriers, 93, 95
  See also Insect Flagellates
Lepidoptera, Dermatitis caused by Hairs, 472, 800, 801
Leptomonas pyrrhocoris, Culture Media, 444 *bis*, 788
Leptus Larva Parasitic in Peru, 474
Leucocytozoon in Cell-nucleus, 788
Linguatula, Diagnosis, 274
Linguatulida, General Survey, 272–275
Linguatulidae, Synopsis of, 475
Linguatulids in Monitors, 420
Liponyssus Mite attacking Man, 800
Lithium Chloride, Action on Mosquito Larvae, 792
Louse and Heredity of Typhus, 270
  See also Crab Louse
Lucilia, Myiasis due to, 796
Lyperosia, Crithidia in, 444
Maggots, Retention of Infection, 269
Malaria, Recrudescence in Attenuated Form, 790
  Report, Federated Malay States, 457

Medical Zoology—*cont.*
Medical Zoology at Harvard, 9
  of Western Pacific Islands, 6, 7
Medusa Venom, Effects of, 478
Microscopic Coprology, 456
Microsporidium in Cestode, 499
Mite Infestations of Man, in Australia, 799 *bis*
Mite-borne Diseases, 272
Mites found in Human Urine and Urinary Diseases, 473 *bis*
  on Mosquitoes, 792
Mitosis of *Entamoeba coli*, 787
Molluscan Fauna of Big Vermilion River, 478
  Fauna of Natal Lagoons, 802
  Genera Bullinus and Physa, 420
Monkey (Macacus), Entamoeba of, 788
Mosquito Larvae, Chara destructive to, 792
  Harbourages of, in Nigeria, 456, 509
  Porters of Eggs of Dermatobia, 796
  Reduction in Australia, 791
Mosquitoes and Drought of 1921, 793
  Reared from Coconut Palms, 792
Musca domestica, *see* House-fly
Myiasis, Cutaneous, in Favus, 465
  and *Wohlfartia vigil*, 467
  Creeping, in Russia, 467
  Pseudo-, in Tamatave, 796
  of Frontal Sinus, 796
  Intestinal, Experimental Studies, 466 *bis*
  Nasal, 465, 796
  New Treatment of, 796
  Orbital, 467, 795
  Subcutaneous, 465
  in Tripolitania, 464
Nucleus of Protozoa and Regeneration of Cell, 439
Nurseries of Insect Life in W. Africa, 456
Nutrient Agar for rearing Dipterous Larvae, 457
Oestrid Larvae, causing Myiasis, 465, 467, 795
Ophthalmomyiasis, 795
Ornithodorus brasiliensis n. sp., 800
  lahorensis and Relapsing Fever, 270
  megninii, 799
  moubata, Distribution in Congo, 471
  normandi n. sp. (Tunis), 800
  talaje and Relapsing Fever, 270
Otobiosis, the Ear-tick Disease, 799
Papers not Abstracted, Titles, 421, 479
Parasites and Carriers, 437
  of Australian Birds, 802
  of Rats, 454
Parasitology, Applied, in Paris, 456
Pediculoides ventricosus, Asthma caused by, 473
  Dermatitis caused by, 473, 800

Medical Zoology—*cont.*
Pentastomida, *see* Linguatulida
Phlebotomus and Oriental Sore, 267
  in Human Pathology, 795
  perniciosus in Paris, 461
  tejerae, new American sp., 795
  Table of Species, 795
  Toxic Vapours for, 461
Phthirius pubis, and Blue Spots, 474
  Digestive Glands, 798
Physa and Bullinus Differentiated, 420
Pigs Infested with Iodamoeba, 7, 113, 787
Pistia stratiotes, Culicid Fauna of, 457
Plants, Protozoon Parasites of, 450, 787
Plasmodium of Dormouse, 445; of Ictonyx, 446
Poisonous Beetles, 472
  Fishes, 420, 801
  Moths, 472, 800, 801
Porocephaliasis, Human Cases in West Africa, 418 *bis*, 475
Porocephalus, Diagnosis, 273
  Massive Infection of Civet, 419
Porto Rico, Mosquito Survey of Mayaquez, 461
Protozoa, *see also* Intestinal Protozoa
Protozoa, Action of Latex upon, 441, 787
  and Protozooses, 788
  Influence of Medium on Alkaloids Toxic to, 782
  in Dog Faeces, 455
  of Euphorbias Inoculated into Mice, 450
  of Muscids Captured on Euphorbias, 450
  Parasitic, in South Africa, 780
  Regeneration of, 439
  Vegetable Organisms mistaken for, 546, 547
Protozoal Diseases, Treatment of, 438 *bis*, 440
Pseudoparasites and Quacks, 456
Pseudotracheal Teeth of Eye-fly, 461
Pupipara, Observations on Larvae, 795
Raillietiella, Diagnosis, 273
Rat-fleas, Diagnosis of spp., 271
  Distribution in Australia, 798
  Distribution in India in relation to Plague, 269, 798
Rats, Ecto- and Endoparasites of, 454
Ray (Fish), Wounds caused by Spines, 421
Reighardia, Diagnosis, 273
Relapsing Fever and Ticks, 270
Report of Entomologist, India, 796; Nyasaland Protectorate, 470; Virgin Islands, 792
Rhinosporidium seeberi, Sporulation and Affinities, 451

Medical Zoology—*cont.*
Rhodnius domesticus n. sp. (Brazil), 474
  prolixus and Transmission of Microbes, 471
Rickettsia, Distribution in Arthropods, 789
Salivary Glands, &c., of Cimex, 474
  Pump of Culicidae, 792
Sambonia, n. gen., Linguatulida, 420
Sandflies, 795
" Sandworm " Disease, Antimony in, 472
Sanitation of Sibolga [Anopheles], 459
Sarcophaga, Myiasis due to, 465
Scomberomorus cavalla, Poisoning by, 420
Scorpion Antitoxin, 476
Scorpion Venom and Adrenalin Syncope, 477
Screw-worm Fly, Range of Flight, 269
Sea-nettle [Medusa], Stings of, 421
Seasonal Prevalence of an Insect, Prediction of, 789
Sebekia (Linguatulid), Diagnosis, 273
Shark-bite, Case of, 52
Sheep, Repugnance of Fleas to, 798
Simulium and Pellagra, 267
Sleeping Sickness in Tanganyika, Entomology of, 469
Snake, Antivenenes, 476, 478
Snake-bite, 475 *bis*, 478
Snake Venom, 478 *bis*
  Action on Bulbar Centres, 476
  Studies in Formosa, 476
Sphyraena barracuda, Poisoning by, 420
Spider Venom, 801
Spitting Snakes, 20
Stegomyia, *see also* Aëdes
Stegomyia, Indian Species, 461
  calopus, Bionomy in Brazil, 460 *bis*
    in Mexico, 792
    in S. Peru, 461
      Control of Larvae by Fish, 267, 460
  fasciata, Effects of Deep Water on Larvae, 792
  pseudoscutellaris, Breeding-places, 6
Sting of Medusa, 421
  Sting-ray, 421
Subtriquetra, Diagnosis, 274
Tarsonemus (Mite) in Urine, 473
Tick-bite Paralysis, 272
Tick-borne Diseases, 270
Tick of Ear, 799
Ticks of Panama, Hosts and Pathogeny, 799
Titles of Papers not Abstracted, 421, 479
Toxin-producing Anaerobe from Fly Larvae, 918
Toxoplasma pyrogenes, 543
Treatment of Protozoal Diseases by Organic Salts, 440

Medical Zoology—*cont.*
Triatoma flavida in Cuba, 798
Tricercomonas, Growth and Culture, 788
Trichomonas Circulating in Blood, 784
  Cultivation, &c., of, 441 *bis*
  Parasitized by Sphaerita, 444
Triple Centrifugation for Isolating Blood Parasites, 439
Trombicula deliensis n. sp., Sumatra, 473, 800
Trombiculae of Sumatra and Pseudotyphus, 473, 800
Trombidiid Larva Dermatitis in Peru, 474
Trombidium akamushi, 272
Trypanosoma lewisi, Biometric Study, 788
Trypanosomes, Action of Latex on, 450
Tsetse-flies, *see also* Glossina
Tsetse-flies of French West Africa, 467
  of N. Nigeria, Investigations, 468
    Natural Infection, 469
    First Report on, 794
Typhus Fever and Lice, 270
Urine, Mites in Human, 473
Venom of " Harmless " Snakes, 478
  of Medusa (*Olindioides formosa*), 478
  of Scorpion, Effects of, 477
  of Spider, Effects of, 801
  of Toad, Action of, 477
Venomous Fish, Wounds from, 421
Virgin Islands, Mosquitoes of, 792
  Poisonous Food Fishes of, 420, 801
Waddycephalus, Diagnosis, 273
Western Pacific Is., Med. Zoology, 6–7
Wohlfartia, causing Myiasis, 465, 467
Xenopsylla, Characters of spp., 271
Xenopsylla astia, Bionomy of, 798
    and Epidemiology of Plague, 269, 798
    in West Africa, 474
  cheopis and Plague Epidemiology and Mortality, 269, 798
Zootropism of Anopheles, 266, 459, 790, 791

MISCELLANEOUS, 1–66, 422–31, 509–20, 601–10, 645–84, 845–54, 891–927
  Abscess at Navel from Penetration of Grass-Seeds, **44** *bis*
  Acclimatization of European Race in Tropics, 14
  Ackee Fruit : Gold Coast, Toxicity, 19
  Acidosis in Stokers : Tropics, **763**
  Actinomyces Salvati n.sp. : Madagascar, **658**
  Actinomycosis of
    Breast, **658**
    Omentum, **509**
    in Rat, **658**

Miscellaneous—*cont.*

- Acute Abdomen in Natives [Basutoland], **921**
- Alastrim, 3
  - or Amaas, **850**
- Aloys Pollender, **852**
- Amaas or Alastrim, **850**
  - Smallpox and, **851** *ter*
- Amyloidosis: Java, **673**
- Anaemia, Sickle Cell, **670**
- Anaesthesia: Surgical, **429**
- Anasarca: Epidemic, North Andamans, **47**
- Aneurysms
    - Belgian Congo, 682
    - West Africa, **50, 655, 656**
  - Multiple, in Child, **50**
- Anthrax in Man
  - French Guinea, **42**
  - Uganda, **42, 909**
- Anthrax Bacillus, Discoverer of, 852–3
- Antimonial Therapeutics, **845** *ter*
- Antimony in Recent Medicine: Bibliography, **61**
  - Toxicity in Rabbits, **62**
- Atropine Response, in White and Coloured Races, **55**
- Autopyotherapy, **426**
- Bacteria, Structure of Certain, **926**
- Bacteriolysis of d'Herelle, **853**
- *Bacterium tularense*: Cultivation on Three Mediums, **43**
- Bats, African, as Lab. Animals, **425**
- Betel Chewing: Effects, including Cancer of Mouth, **56**
- Bismuth: Effect on Kidneys, **853**
- Blastomycosis, Systemic [in American Negro], **426**
- Blood(s)
  - Bilirubin-Content, **851**
  - Exam. by Wassermann and other Reactions, **31**
  - Filipino, Iso-Agglutinable Percentages of, **427**
  - Non-Protein Nitrogen of, Effect on, of Tartar Emetic, **845**
  - Occult, in Faeces: Tropics, **917**
  - Platelets and their Functions, **854**
  - Transfusion: Moss Formula, **852**
  - Yeast-like Bodies in Human Blood, **921**
- Blood-Count, Differential, **425**
- Body Tissues, Heating of, by Light and Heat Rays, **761**
- *Boerhaavia diffusa*: Pharmacology: Therapeutics, **923**
- Bronchomoniliasis, **656, 657, 905**
- Broncho-pneumonia, Epidemic: Belgian Congo, **675**
- Calf Lymph for B.E. Africa, 510

Miscellaneous—*cont.*

- Cancer, All Forms
    - in Africa, India, and D.E.I., **24, 25**
    - in Algerian Woman, **26**
    - and Cancer of Liver in Natives, **23–7**
    - Deaths from: Cuba and Europe, 26
    - Etiology and Statistics: Cuba, **26**
    - of Gum and Liver [in Natives], **23** *bis*
    - House Infection, **906**
    - Intestinal, and Parasites' Ova, **214**
    - of Mouth, as due to Betel-nut Chewing, **56**
    - Primary, of Liver: India and D.E.I., **24, 25**
    - Vegetables in relation to, 26
  - Carcinoma, Hepatic, and Bilharziasis, **213,** 668
  - Epithelioma of
    - Eyelid, **927**
    - Oesophagus, **27**
- Carbon Tetrachloride: Toxicity, **922**
- Chlorine Secretion in Fever, **851**
- Cinchona Alkaloids
  - Researches, **57**
  - Therapeutics, **763**
- Climatology and Pathology: Fort Lamy, **682**
- Colonial Medical Services, Training for, **900**
- Complexion in Tropics, **610**
- Countries and Places referred to: Diseases Prevalent in, &c.
  - Africa, Central: Tumour Frequence in Natives, **667, 668**
  - Algeria, **667**
    - Hot Springs, **429**
  - Annam: Bà-Na Sanatorium, Temperatures at, **753**
  - Anatolia: Field-Lab. Work, **897**
  - Australian Commonwealth
    - Australian Inst. Trop. Med., **927**
    - Encephalo-Myelitis, Acute: Epidemic, **649**
    - Townsville Institute, Future of, **13**
    - Tropical: White Settlement, **914** *bis*
    - Tropical Research, **13**
  - Belgian Congo, 512–13
    - Case Simulating Acute Articular Rheumatism, **673**
    - Native Pathology, 517, **675, 682** *bis*

Miscellaneous—*cont.*
- Countries, &c.—*cont.*
  - Brazil
    - Climate: Diseases: European Immigration, **16, 429**
    - Fruits, **428**
    - Medicine, **901**
  - China, Chinese
    - Diseases Cured by Santonin only, 666
    - Foods, **609**
    - Materia Medica, **763**
  - Colombia
    - Bucaramanga Epidemic, **911**
    - Hygiene, **648**
  - Dahomey: Morbidity and Mortality, **749**
  - Dakar, Cancer at, **23** *bis*
    - Institute of Social Hygiene, **849**
    - Kolaism, 12
    - Native Lying-in Hospital and Polyclinic, Work of, **11, 12**
  - Dutch East Indies, 14, **22, 24, 25, 31,** 514, **663, 674, 753,** 849, 851–2
    - Acute Mental Disorders, **601, 924**
    - Aorta of Malay Men, **923**
    - Cholesterol Blood-Content, **425**
    - Circumcision, **683**
    - Mestizos of Kisar, **14, 915** *ter*
    - Native Psychoses, **601**
    - Splenic Anaemia, Splenectomy and, **609**
    - Tropical Med. Congress: Exhibits, **683**
  - East African Protectorate, 510–11
  - Ecuador, **850**
  - Egypt: Insanity, **602**
  - Far East, French Med. in, **15** *bis*
  - Federated Malay States, **513**
    - Far Eastern Assoc. Trop. Med. 5th Congress: Singapore, **519**
    - Singapore, Rickets in, **672**
  - Fernando Po, 24
  - Formosa, **752**
  - France: Spas: Value for Tropical Convalescents, **848** *bis*
  - French Equatorial Africa
    - Features, **750**
    - Native Recruits from Various Districts Compared, **749**
  - Gold Coast, **10**
  - Haiti, 894
    - Dog-wood Poisoning, **429**
    - Hygiene Lab., **894**
  - India, Epidemic Dropsy, **664**
      - Maternity Conditions, **482**

Miscellaneous—*cont.*
- Countries—*cont.*
  - India—*cont.*
    - Calcutta, **755** *bis*
      - School of Tropical Medicine Report: Programme, **755**
  - Indo-China: Endemo-Epidemic Diseases (1921), **896**
  - Kenya: Education and Physical Development of White Children, **915**
  - Macao: Medical Climatology, **609**
  - Madagascar, **10, 658, 659** *bis*
  - Malta Command: Bacteriological Exams. in Influenza (1918), **902**
  - Mauritius, 513–14
  - Mongalla, **899**
  - Morocco: Population Stabilisation, **900**
  - New Caledonia: Niaouli Essence, 429
  - Nigeria, **509**
    - Deep Abscesses, **650**
  - Peru: Pulmonary Parasites, **752**
  - Philippine Islands, **424, 666, 672**
    - Bananas and Rice, **429**
  - Porto Rico, **751**
    - Diagnosis of Fevers, **86**
  - Rhodesia, Blondes in, Environmental Influences affecting, **758**
  - Russia [Tropical Institute], **18, 927**
  - Samoa: Encephalitis lethargica, **671**
    - Tattooing, **919**
  - Siam: Epidemic among Recruits (1923), **903**
    - National Immunity to Disease, of Natives, **919**
  - Sidi-Abdallah, Native Sailors from [Health of], **12**
  - South Africa, 511–12, **921**
    - Pseudo-Tuberculosis, 896
    - Rand Mines, Medical Services for Natives on, **13**
    - Toxicology, **763**
  - Spain: Parasitic Diseases, **754**
  - Syria and Lebanon, **900**
  - Tropics
    - Ether in, **852**
      - New Apparatus, **423**
    - Laryngeal Complications, **763**
    - South America: Climate and Health, **24**
    - Therapeutics in, **54**
  - Uganda, **42,** 515, **909**
  - U.S.A.: Massachusetts, **75**
  - Venezuela, 17
    - Medical Geography, **16**
    - Vital Statistics, 16

Miscellaneous—*cont.*
Countries—*cont.*
  West Africa, 26, **426**, **663**
    First Congress of W. African Tropical Medicine, **519**
  West Indies Medical Conf., 1–4
    Sanitary Commissioner for, 1
  Western Pacific: Medical Researches in the, **5–7**, **891**
  Yunnan-fu, **14**
Diabetes mellitus in Filipinos, **672**
Differential Leucocyte Count, **851**
Digitalis: Physiological Standardization, for Use in India, **65**
Diphtheria: Mauritius, 513–14
  Carriers: Simla, **667**
  and the Schick Reaction
    Algiers, **667**
    Philippine Islands, **666**
  South African Natives Non-immune, **512**
Diseases in which Antimony is Employed, **61**
  Tropical and Sub-Tropical, **17**
Doctors and French Colonies, **763**
Drought as Disease Factor: Cabo Verde, **852**
Ear, The, Care and Treatment of, in the Tropics, **424**
  Nose, and Throat Cases in the Philippines, **424**
Ectodermoses: Immunity in, **7**
  Neurotropic, **680**
Elephantiasis of Genitals with Gynaecomastia, **50**
  Nostras: P.M. findings, **902**
    Treatment by Kondoleon's Operation, **903**
Elephants' Hairs as Bougies, 54
Emetine: Cure by, of Simulated Articular Rheumatism, **673**
  Dosage, Guide to, 54
  Effect on Heart, **63**
  and Emetine Poisoning, **668**, **669** *ter*
  Poisoning: Polyneuritis: Death, **62**, **63**
Encephalitis lethargica: Samoa, **671**
Endocrine Glands: Importance in Trop. Pathology, **428**
Euglobulin Group and the Wassermann Reaction, **516**
Euphysol chininum, Research on, **762** *bis*
Exanthems, Acute: Spirochaetosis (hypothesized), **883** *bis*
Fibroma, Naso-pharyngeal, **927**

Miscellaneous—*cont.*
Filterable (Ultra-Microscopical) Viruses
  Active Principles, **676**
  Differential Centrifugation for Study of, **847**
  Neurotropic
    Filtration through Collodion Membranes, **925**
    Physical Properties, **925**
  Résumé, **8**
Finlay, Carlos, Memorial, Havana, **56**
Fish Oils and Fish Liver Oils, Vitamins in, **763** *bis*
Formol-gel and Hecht-Bauer Reactions in Malaria, Leprosy and Yaws, **761**
French Natives: Army of the Rhine, relative value of Contingents, **755**
Fungi, Higher: Visceral Infections due to, **49**
  Parasitic: Venezuela, **49**, **429**
Glanders in Man, **42**, **927**
Goitre, Endemic, and Cretinism: Causation, **427**
Haemogram in Tropical Practice, **926**
Head Injuries and African Residence, 54
Heat Balance Sheet of Tropical Residents, **922**
  and Digestion of Infants, **927**
Hypereosinophilia, Idiopathic, **918**
Immunity, General, Conferred by Local Immunization, **678**
Incidence and Incidence Rate, **854**
Inulin and Maltose: Mycological Method of Identification, **920**
Iodine Injections for Septic Conditions, **66**
Jamaican Dog-wood, **429**
Jaundice, Infectious, *see that head*
  Obstructive: Port Sudan, **660**
  Toxic: Andamans, **660**
Khesari Amine: Production: Pharmacological Action, **645**
Kohl, **919**
Lab. Animals, Cages for, **428**
  for Tropical Research, **429**
Lathyrism, **904**
  Cause, **46**, **645**
Leucaemia, Lymphoid, of pure Splenic type, **428**
Liver Cirrhosis
  and Cancer, D.E.I., 25
  Etiology, **22**
  Tropical: Pathology, **675**

Miscellaneous—*cont.*
Lymphogranuloma, Climatic Bubo and, **35, 666**
  in Javanese, **36**
  malignum, **905**
Maltosuria, **920**
Manson, Sir Patrick, **55, 56**
Margosic Acid and its Salts: Clinical Use, **762**
Maternity Hospital, Kisaran, Data from, **422**
Medical Geographical Map of the World, **648**
Medical Research: Aims: Economic Value, **927**
Medicine: Ayurvedic System: Merits, **920**
  Oriental, Counter-Irritation in, **927**
Meinicke's Floculation Test and other Serodiagnostic Methods, **514, 515, 516, 517**
Melioidosis: F.M.S., 513
Meningitis, Pneumococcal
  Belgian Congo, **39**
    Optochin Treatment, **672**
  South Africa: Classification of Pneumococci, **511**
Metabolism, Relations to, of Climate, Weather, and Fat Covering, **918**
Mice, Albino, Adaptation of, to Artificially-produced Tropical Climate, **759**
Microscope Instruction: Belgian Congo, 513
Multiple Haemorrhages, **671**
Mycoses(sis)
  China, **635**
  Pulmonary, **658**
Myositis, Description in Osler and McCrae's "System," 29
  Tropical, in
    Fernando Po, **27**
    French Equatorial Africa, **28**
    Nigeria, **650**
    Papua, **29**
    Uganda, **900**
Niaouli: Fungus Menacing, **429**
Nocardiasis, Disseminated, 49
Oedema
  Java, **663**
  West Africa, in Porters, **663**
Optochin in Pneumococcal Meningitis, **672**
Paget's Disease *plus* Breast Cancer in Male Sudanese, **27**
Persian Forces, North: Memorial Medal, 261
Pigmentation, Abnormal, of Colon, **910**
Plumbism: Blood Examination, **909**

Miscellaneous—*cont.*
Pneumococcus Infections, *see* **Pneumonia and Other Pneumococcus Infections,** *see also* Meningitis, *supra*
Poisons and Poisoning
  Arsenical
    Less known Methods of, **676**
    Sequelae, **675**
  Khesari Amine: Production: Pharmacological Action, **645**
  Kodon, Acute, **676**
  Yam, **51**
Pollender, Aloys, **852**
Pougues-les-Eaux, and Tropical Diseases, **927**
Pseudo-meningococcus from Iliac Abscess, **43**
Psychology, Native, **429**
Psychoses of Southern Negro, **55**
Quinine Anaphylaxis, **60**
  in Blood, Nephelometric Estimation of, **59**
  Hydrochloride, Solubility of, **59**
  Intolerance, **846**
  Necrosis of Muscle, **846**
  Studies on, **845**
  Subcutaneous Injections, Danger in, of Necrosis, **59**
Rats, Brown and Black: Introduction to Europe, 17–18
Rhino-pharyngitis mutilans, **50**
"Rickettsia" Bodies due to Lysis, **677**
Rubber Articles: Preservation in Tropics, **53**
Saccharomycete, Pathogenic to Guinea-pig in Human Lesion, **658**
Salvarsan Intrarectally, **65**
  Poisoning, **610**
Sapodilla: Properties, **429**
Septicaemia from a *Pasteurella*-like Organism: Clinical Observations, **44** *bis*
Shark Bite, **52**
Sir Patrick Manson, **55, 56**
Skin-Grafting in Coloured Men, **848**
Spirilloses, Action in, of Bismuth, **910**
Sporotrichosis
    Madagascar, **659** *bis*
  Pulmonary, **426**
  Sporotrichum Carougeaui n.sp., **659**
Starvation, Chronic: Effects
  Indian Famine, 53
  Siege of Kut, **52, 53**
Streptothrix Infection of Brain: Mesopotamia, 49
Sugars, Various, Detection of, by Mycological Method, **424**

Miscellaneous—*cont.*

- Sun's Rays: Effect on Hats in Summer, **54**
- Sweat Secretion in Man: Estimation, **683** *bis*
- Teeth, Loss of, from Betel Chewing, 57
- Tetanus: Venezuela, 17
  - Neonatorum, *ib.*, 17
- Titles of Unnoticed Papers, 66, 430–1, 520, 684
- Tonsillomycoses, **657** *bis*
- Tropical Medicine
  - Classification and Nomenclature, **757**
  - Harvard University Course, **8**
  - Objectives, &c., **9**
- Tularaemia Francis 1921: New Human Disease, **664, 665**
- Tumours in Different Races: Deli, Sumatra, **24**
  - of Dental Origin [West Africa], **26**
  - in Natives [Central Africa], **667, 668**
- Ulceration(s), Ulcers, Sores, &c.
  - Gastric: Sumatra, **674**
  - Sores, Phagedenic, Treatment by "189," **181**
  - of Throat, from Vincent's Spirobacillus: Belgian Congo, **45**
  - Treatment by Iodine Injection, 66
- Vaccination by Neurovaccine, **847**
- Vaccine
  - Cerebral, **7**
    - Pure, **7**
  - and Neoplasms, **847**
- Vaccinia, Affinities, Dermo-, and Neurotropic, **7**
- Vegetable and Human Pathology: Relations, **423**
- Venereal Diseases, *see also* **Syphilis**
  - Incidence
    - D.E.I.: Army, **31**
    - F.M.S., 513
    - French Colonies, **651**
    - Uganda, 515
  - League for Combating: Bombay, *see under* **Reports**
  - Prophylaxis: Uganda, **650**
  - Treatment
    - Combined Salvarsan-Mercury, Intoxications from, **653**
    - Tartar Emetic, **30**
    - in Uganda, **650**
- Vincent's Angina, **927**
- Wassermann Reaction in the Tropics
  - Modifications and, **514–18**
  - Stable Haemolytic Serum for, **911**
- Yam Poisoning, **51**

OPHTHALMOLOGY, TROPICAL, 497–508, 979–89

- Amblyopia, Quinine; Pathogenesis; Special Reference to Ethylhydrocuprein Hydrochloride, **985**
- Atrophy, Optic [Madras], **984**
  - Radiography in Doubtful Cases, with Special Reference to Pituitary Disease, **498**
- Berger's Stereoscopic Lenses for Ophthalmic Practice, **979**
- Blindness
  - among Filipinos: Causes, **508** *bis*
  - in Libya: Causes, **498**
- Cataract, Black, **987**
  - Caused by
    - Electric Shock, **498, 988**
    - Lightning Stroke, **498**
  - Clinical Notes, **988**
  - in Sumatra, 989
- Cataract Extraction
  - Capsule Lavage in, **987**
  - Complications after, **987**
  - Intracapsular, Vitreous Escape in, **987**
  - Madras Operation, 988
  - in Norway, **986**
  - Senile, in Capsule, **986**
  - Subconjunctival, **986** *bis*
- Cataractous Lenses, Weight of, **988**
- Conjunctivitis
  - Gonococcal, Epidemic [Indo-China], **979**
  - Habronemic: "Bung Eye": Australia, **503**
  - Koch-Weeks; Prophylactic Vaccination, **979**
- Cysticercus Cellulosae, Intra-Ocular [South Africa], **984**
  - Subconjunctival
    - [Argentina], **533**
    - [Madras], **984**
- Exophthalmos, New Kind: D.E.I., **499**
- Eye in Beri-beri, **984**
- Eye Diseases: 'Iraq, **988**
- Filaria in the Eye, **500** *quat.*
- Glaucoma: Baghdad, 988
- Granuloma, Subconjunctival, Rare Form, **497**
- Keratitis, Parenchymatous: Sumatra: Causes, 989
- Neuritis, Retrobulbar, of Malarial Origin, **985**
- Notes [West Africa], **506**
- Ocular Complications of Malaria, **985** *bis*
  - Sparganosis, **501**

Ophthalmology—*cont.*
- Ocular Diseases in the Tropics [Sumatra], **989**
  - Tumour, due to Lung Distoma, **503**
- Onchocerciasis, Ocular: Guatemala, **501** *bis*
- Ophthalmic Operative Clinic [China]: Abstract, **508**
  - Hospital, Madras, Practice of, **988**
- Ophthalmological Inst., Hanoi, **506**
  - Hue, **507**
  - Soc. Egypt: Bull., 1921, **505**
- Ophthalmomyiasis: Cape Verde Is., **502** *quat.*
- Parenteral Milk Injections in Eye Diseases, **507**
- Pigmentation of Corneal and Conjunctival Epithelium **497**
- Titles of Unnoticed Papers, 989
- Trachoma
  - Incidence
    - Algeria, 981
    - Annam, **980**
      - Index, **980**
    - Baghdad, 988
    - China, **981**
    - Madagascar, **981**
    - Minnesota, **981**
    - Tunis, **980**
  - Nature of, **983**
  - Obstinate: New Treatment, **982**
  - Prophylaxis, **981**
  - Treatment, **980**
    - Abadie Method, **982**
    - Operative: Excision of Fornix, **983**
- Trichiasis and Entropion: Treatment by Lagleyze's Operation, **983**
- Vitrex Glass, **499**

OROYA FEVER, 810–11

PAPPATACI FEVER, 383–5, 804–7
- Fever resembling: Cuba, **806**
- Incidence
  - Beyrouth, **385**
  - Georgia, and Neighbouring Regions, **385**
  - Hinaidi, 'Iraq, **806**
  - Malta, **385**
  - Trebizond, 385
- Nervous Sequelae, **806**
- Phlebotomus Fever, 388

PELLAGRA, 75–8, **887** (Review of Recent Articles on)
- and Beriberi Combined, **905**
- Blood Picture in, **890**

Pellagra—*cont.*
- Chittenden-Underhill Pellagra-like Syndrome in Dogs: Probable Identity with "BlackTongue": Necrosis, **77**
- Drought-induced, 852
- Etiological Factors, Search for, **889**
- Etiological Theories
  - Excess of Carbohydrate in Diet, **889**
  - Food Deficiency, 2, **78, 888, 890**
    - Amino-Acid, **889**
    - Protein, **888, 889**
  - Infection, **887**
- Incidence
  - Age
    - Breast-fed Infant, **77**
    - Young Child, **77**
  - Geographical
    - Berlin, **890**
    - Cabo Verde, 852
    - Egypt (1846), **75**
    - Italy, in Evacuated Population, **76**
      - Since 1910, **75**
    - Ontario, **890**
    - Portugal, **890**
    - U.S.A., 75
      - Massachusetts, **889** *bis*
      - Southern, 78
    - West Africa (possible), **890**
    - West Indies, 2
  - Occupation, 889
  - Sex, 889, 890
- Lantern Slide Demonstration, **78**
- Maize in relation to, 75, 76, **76**
- Treatment
  - Dietetic, 75
    - Daily Supplemental Meal, **75**
- Zeism, Experimental: Causes, **76**

PLAGUE, 357–65, 741–6
- Bacteriology
  - *B. pestis*
    - Fine Structure, **365, 745**
    - Persistence in a Bubo, **362**
    - Strain Isolated from Healthy Human Carriers: Comparative Virulence, **745**
  - Pseudo-Plague Cocco-bacillus, **364**
  - *B. pseudotuberculosis rodentum* and Chronic Plague, **364**
- Bat Susceptibility to, **742**
- and Climatic Bubo, **743**
- Clinical Forms, **362**
  - Observations, **745**
- Diagnosis, **362**
  - Importance in, of
    - Blood Culture, **363**
    - Thermopreciptin Test, **363**

Plague—*cont.*
- Incidence
  - Geographical
    - Angola (Loanda), **741**
    - Astrakan, **359**
    - D.E.I. : Java, **741** *ter*
    - Holland, **364**
    - India : Bombay, 364
    - Kirghiz Region, **359**
    - Manchuria, **358, 365**
      - Harbin, **358**
    - Paris, 361, **745** *bis*
    - Russia and Frontiers, **357, 358,** 359
    - Senegal (1920), 20, **746**
      - Dakar, 363, **365, 744**
    - Tananarivo : Epidemic, **365**
    - Trans-Baikal, **358**
    - Uganda : Bukedi, **357**
  - Shipboard, **742**
- Melanchthon's Recipes, **745**
- Plague Meningitis, **744**
- Pneumonic : Pneumonia and, **362**
- Prophylaxis
  - Anti-Plague Vaccination, 20
- Pulmonary
  - Atypical, **744**
  - Studies on, **743**
- Rat-Plague : Indicators : Java, **361**
- Report : Bombay Bacteriological Lab. (1921), **364**
- in Rodents and Shrews : Dakar, **742**
- Septicaemic
  - Frequency, **363**
  - Infant Receptivity, **362**
- Shrews as Reservoirs : Cambodia, **742**
- Some features of, **365**
- Sputum, Lab. Exam. of, **745**
- Titles of Unnoticed Papers, 365, 748
- Transmission, Actual and Possible, by
  - Camels and Mice, **359** *bis*
  - *Echidnophaga gallinacea*, 20
  - Fleas, 19, **359, 360**
  - Rats, **360, 361**
  - in Java, **741** *bis*
- Treatment, **745**
  - [Serotherapy], **362**
- *Xenopsylla aequisetosus* in relation to, 19, **359, 360**

Pneumonia and other Pneumococcus Infections
- Pneumococcus, **39** *bis*
  - African Strains : Agglutination of (*table*), 40
  - Infections in Black Troops in Africa, **41**
- Pneumonia in Belgian Congo, 40

Pneumonia, &c.—*cont.*
- Pneumonic Infections in West Africans : P.M. Findings, **41**
- Prophylaxis
  - Pneumococcal Vaccine, 40, 41

Rabies
- Incidence
  - Dahomey, **31**
  - Dutch East Indies, 603
  - French Equatorial Africa
    - in Dogs at Brazzaville, **602**
  - French West Africa, **31**
  - Irak, **602**
  - Portugal, 603
  - Senegal, 20, **31** *bis*
  - Tunis, 33
- Nervous Disease after Treatment with Fixed Virus, **34**
- Treatment
  - Antirabic,
    - Efficacy, **32**
    - Instituto Bacteriologico Camara Pestana, Lisbon : Statistics, **603**
    - Pasteur Institute Methods : Weltevreden, **603**
  - Carbolized Vaccine, **602**
- Virus
  - Hedgehogs and, **604**
  - Neurotropic Affinity, **7**
  - Senegalese : Identification, **31**

RAT-BITE SPIROCHAETOSIS, 581, 880–1
- Histological Exam. of Tissues, **881**
- Incidence
  - Colombo, 881
  - Constantinople, **581**
  - D.E.I., **880**
  - India, 581
    - Etiological Agent, **881**
  - Italy, **880**
- Infecting Agent
  - in India, **881**
  - Nature of, **581**
- Rash, **581**
- Spirochaetes of, 881
  - and Rat Spirochaetes, Comparative Study of, **581**
- Treatment by
  - Neosalvarsan : Cure, **881**
  - Sod. Cacodylate, **881**

RELAPSING FEVER and Other Spirochaetoses, 129–40, 578–80, 877–80
- Etiology of Complications, **578**
- Friedberger's Reaction in, **39**
- Historical, **136**

Relapsing Fever—*cont.*

- Incidence
  - [Accra], **580**
  - Angola, **580**
  - California, **132**
  - India, **580** *bis*
    - United Provinces, **134**
  - North Africa, **133**
  - Panama, **131**, **132**
    - Rat as Spreading, **132**
  - Persia, **134**
  - Sudan, **132**
- Lice as Vectors, 132, 133, 134
- Münch's Work on, **136**
- *Ornithodorus* sp. as Vectors, 132, 134–5, 580
- Pathological Anatomy, **578**
- OTHER SPIROCHAETOSES
  - AVIAN
    - Action in, of Bismuth, **910**
    - Treatment by
      - 914 & 190, Orally, **578**
      - Trépol, **579**
  - BRONCHIAL : Bloody, **580**
    - Castellani's : Treatment by Iodine, **579**
    - Incidence
      - China, **137**, **580**
      - Portugal, **137**
  - Spirochaetosis icterohaemorrhagica, *see* **JAUNDICE, INFECTIOUS**
- Sequelae : Hepatic Cirrhosis, **578**
- Spirochaetal Diseases, Immunity in, **130** *bis*
- Spirochaetes
  - Associated with : Cultivation, **135** *bis*
    - *crocidurae* : Passage through Placenta, **139**
    - *eurygyrata* : Life-History : Cultivation, **579**
    - Panama Species, **131**
      - Suggested Name, **132**
    - *recurrentis* : Development in Man, **135**
  - in Blackwater Fever (*q.v.*), **138** *bis*, Erratum, **202**
  - Nature of, **129**
  - in Rats and Mice, **140**
- Title of Unnoticed Paper, 140
- Treatment by
  - Arsalyt, **578**
  - Neosalvarsan and Lactose Injections, **123**

Reports, Annual

- Belgian Congo : Leopoldville Lab. (1921) **512**
- British Guiana Soc. for Prev. and Treatment of Tuberculosis (1923), **998**

Reports, Annual—*cont.*

- Dutch East Indies
  - Central Military Med. Lab. (1921) [Beriberi, Dysentery], 22
  - Civil Med. Service (1920), 753–4
  - Medan Pathol. Lab. (1907–21), 849
  - Military Med. Service (1919–20), 22
  - Weltevreden : Med. Lab. (1920), 21
- East African Protectorate Bacteriol. Lab. (1919), 510–11
- Egypt : Ophthalmic Section, Ministry of Public Health (1920–1), 504, 505
- England : Lunacy Board on Dysentery (1921), 728
- Federated Malay States (1921)
  - Dysentery, 412–13
  - Institute for Med. Research, 513
  - Malaria, 301, 457
- French West Africa : Inst. Biol. (1920), 19
- Gold Coast : Accra : Med. Research Inst. Lab. (1921), 18
- Grenada : Intensive Treatment of Yaws (1922), 843
- India
  - Assam : Public Health (1921), 94
  - Bombay : Bacteriol. Lab. (1920–1), 596
      - on Plague (1921), 364
    - League for Combating V.D. (1921–2), 30
  - Calcutta
    - Kala Azar Research Lab. (1921), 93
    - School of Trop. Med. and Carmichael Hosp. (1922), 755
  - Madras Govt. Gen. Hosp. (1921), 101
    - King Inst. Preventive Med. (1921–2) and Microbiological Section (Jan.–Mar., 1921), 893
- 'Iraq Health Services (1921), on Eye Diseases, 988
- Japan : Tainan Hospital, Med. (1920–2), 752–3
- Mauritius
  - Bacteriological Lab. (Apr.-Sept., 1922), 513
  - Med. & San. (1921), 4
- North Holland Malaria Commission (1922), 962
- Pasteur Institutes
  - Algeria (1921), 21
  - Saigon (1921), 894
  - Tunis (1921), 33
- Rio de Janeiro and S. Paulo on the Liga Paulista against Tuberculosis (1922 & 1923), 998, 999

Reports, Annual—*cont.*
  South African Inst. for Med. Research (1921), 511–12
  Tanganyika Med., San. and Dar-es-Salaam Lab. [on Leprosy] (1921), 483
  Transvaal Med. Off. Assoc. on Tuberculosis in Mine Natives (1922 & 1923), 990, 991
  Uganda: Bacteriological Dept. (1922), 691

REVIEWS AND NOTICES, 82–4, 166–8, 262–9, 346–52, 432–6, 521–6, 611–14, 685–6, 765–70, 856, 928–32, 1003–6
  Alphonse Laveran (Phisalix), 525–6
  Bac. & Clin. Obs. on Pneumonia & Empyemata with special Ref. to the Pneumococcus & to Serum Treatment (Glynn, Digby & Jones), 1003–4
  Centenaire de Louis Pasteur. Les Instituts Pasteur d'Indochine (Bernard), 433–4
  Critical Microscopy (Coles), 346–7
  Depopulation of Melanesia (Rivers) 83–4
  Diseases of the Skin (McKenna), 351
  Framboesia tropica (Spittel), 263
  Guide to the Wellcome Museum of Tropical Hygiene, 84
  Hygiene and Disease in Eastern Tropical Africa (Admiralty & W.O.), 932
  Infusoires ciliés du tube digestif de l'homme . . . (Buisson), 352
  Kala Azar (Napier), 928
  Laboratory Studies in Tropical Medicine (Daniels & Newham), 434–6
  Lymphogranulomatose des Ganglions Inguinaux: Rapports avec Bubon Climatérique (Phylactos), 432–3
  Maladies Parasitaires des Plantes (Nicolle & Magrou), 166
  Malaria at Nieuwendam (Honig), 685
  Malay Poisons and Charm Cures (Gimlette), 351
  Med. Pract. in Africa & the East (Martin & Weir), 1004–5

Reviews—*cont.*
  Med. Services—Pathology History of the War (Macpherson, Leishman, & Cummins), 1005–6
  Memoirs: With Full Account of the Great Malaria Problem and its Solution (Ross), 611–13
  North Manchurian Plague Prevention Service Reports, 1918–22 (Teh, W. L.) 82
  Parasitic Rhizopods, The (v. Ostertag, Wolffhügel & Nöller), 347–8
  Parasitologische Diagnostiek, De, van de Menschelijke Faeces (Brug), 929–30
  Peking Medical College Papers, 168, 524
  Physiologie Pathologique du Foie (Roger), 166
  Poradenitis Inguinal Subaguda (Destefano & Vaccarezza) 525
  Practical Bacteriology, Blood Work & Parasitology (Stitt), 685–6
  Practical Hygiene of Native Compounds in Tropical Africa (Pearson & Mouchet), 526
  Practice of Medicine in the Tropics (ed. Byam & Archibald)
    Vol. III, 521–4, 769–70
      Section XI. Helminthiasis, 614
  Précis de Parasitologie (Brumpt), 262 *bis*
  Protists and Disease (Clarke), 351–2
  Protozoi patogeni per l'uomo e per gli animali (Sangiorge), 765
  Rockefeller Foundation: Review for 1922 (Vincent), 856
  System, A, of Surgery (Choyce & Beattie), 767–9
  Textbook of Medical Entomology (Martini), 766–7
  Tortola (Jenkins), 930–1
  Treatment of Malaria with Cinchona Alkaloids (Fletcher), 1004
  Typhus Fever: Russian Epidemics (Mitchell, Ashburton & Richardson), 83
  Vade Mecum a l'Usage des Infirmiers Médicaux-Indigenes (David), 168

Reviews—*cont.*
- Vitamins in Urine (Van der Walle), 765–6
- Wayao, The, of Nyasaland (Stannus), 167

Rickets
- Incidence
  - India, **48**
    - Class Incidence: Causes, 48–9
  - Singapore, **672**

ROCKY MOUNTAIN SPOTTED FEVER, 387, 808–9
- Immunity Studies, **809**
- Organisms of: Cultivation, **808**
- *Rickettsia* causing, Cytological Study of, **387**
- Transmission by Ticks
  - Fed and Fasting, **808**
  - Rabbit Species, **808**
- Weil-Felix Reaction in, **808**

SCURVY, 396–9, 818–19
- Anaemia, Alimentary, and, **396**
- Antiscorbutic
  - Preparation [from Fresh Cabbage Juice], Effect on Guinea-pigs, **398**
  - Substance, Non-Antiscorbutic Adjuvants of, **397**
  - Values of
    - Native Foods: South Africa, 511
    - Sterilized Lemon Juice, **397**
  - Vitamin in
    - Fresh and Preserved Vegetables, **818**
    - Oriental Fruits and Vegetables, **818**
    - Solubility of, from Desiccated Orange Juice, 398
- Beer and, **397**
- Etiology: Modern Views, **819**
- Experimental, **818, 819**
  - of Guinea-pig, and Tuberculosis, 399
- Incidence
  - Kut, 53
  - Singapore, 672
  - South Africa, in Natives, **396**
- Infantile
  - Dried Milk in, **397**
  - Sero-Diagnosis, &c., **338**
  - Trypanocidal Bodies in Blood, **337**
- Thymectomy in relation to Survival of Guinea-pigs, **819**
- Treatment by Orange Juice Intravenously, **396**
- Vitamin C Deprivation: Results, **818, 819**

SLEEPING SICKNESS, 309–38, 687–702
- GLOSSINA
  - Bait for, 310, 314
  - Distribution of Species, 309
  - *palpalis* Pupae, far from Water, 317
  - *swynnertoni*: Mwanza, 310, 312
- Titles of Unnoticed Papers, 338, 702
- TRYPANOSOMES
  - Action on, of Various Drugs, **697**
  - *brucei*, as a Filterable Virus, **335**
    - Trypanocidal Serum and, **335**
    - Passage through Mice: Spirochaetes present, **701**
  - *cruzi*, in Armadillo's Tissues, **699**
    - Transmission by *Triatoma brasiliensis*, **699**
  - *equiperdum*, action on, of "Bayer 205," **325, 702** *bis*
  - Polymorphic, of Mule: Accra, 19
  - Two New Trypanocides, **702**
- TRYPANOSOMIASES
  - ANIMAL
    - DOURINE
      - Treatment by "Bayer 205," **325**
    - MAL DE CADERAS
      - Treatment with "Bayer 205," **326**
    - NAGANA, Experimental, in Mice: Action of Atoxyl, **701**
      - Salvarsan in: Relation of Dose to Degree of Infection, **701**
    - SURRA: Malaya, 326
      - Treatment with "Bayer 205," **326**
  - EXPERIMENTAL
    - Encephalitis in, **699**
    - Spirochaetes appearing in *T. brucei* passages through Mice, **701**
  - HUMAN, AFRICAN
    - Action in, of Bismuth, **910**
    - Axillary Gland Enlargement in, **690**
    - Blood in, Influence on, of "Bayer 205," **697**
    - Cerebrospinal Fluid
      - Action on, of Tryparsamide, **694**
      - Arsenic Penetration into, **695**
      - in relation to Treatment, **329**
    - Epidemiology, **687**
    - Incidence
      - Angola, **316**
      - Belgian Congo, 512, **691**
      - Chad, Lake: New Focus, **689**
      - Fort Lamy Region, 682
      - French Equatorial Africa, **314**
        - West Africa, **315, 316**
      - Lualaba River, **690**

Sleeping Sickness—*cont.*
- TRYPANOSOMIASIS—*cont.*
  - HUMAN—*cont.*
    - Incidence—*cont.*
      - Mwanza, **309**
        - Entomological Aspects, **311** **469**
      - Nigeria
        - Eket, **688**
        - Wamba, 324
      - Portuguese Africa, 324, **499**
      - [Rhodesia], **317**
      - Uganda, **691**
        - Bukedi, **690**
    - Interstitial Keratitis in, 317
    - Prophylaxis: French Equatorial and West Africa, **314, 315, 316**
    - Treatment
      - Principles of, during Second Stage, **693**
      - Various Remedies, 512
        - Arsenobenzols, Activity of, **697**
        - Atoxyl: Rules, **691**
        - "Bayer 205," **317,** 321–2, **322, 323, 324** *bis*, **697, 698, 702**
          - Summary of Work done with, **325**
          - Tests, **317** *sqq.*
          - Trypanolytic Property of Serum after Cure by, **698**
        - "Marshall" Method, **698**
          - Intrathecal Injections, **331**
        - "189," **327, 328** *bis*, **329**
        - Trépol, **329**
        - Tryparsamide, **327, 694**
        - Trypanocidal Serum: Clinical Value, **335**
    - Trypanocidal Substance in Serum of
      - Children: Content, **337**
      - Man, **700**
        - Disappearance in Liver Disease, **337**
    - Van Saceghem's Trypanoléine Test, **702**
  - HUMAN, AMERICAN, CHAGAS'S DISEASE
    - Cardiac Form, **335**
    - at Lassance, 699
- Trypano-spirochaetic Infection, **701**

Smallpox
- Amaas, and Alastrim, 850, **851** *ter*
- Incidence
  - Baghdad, **655**
  - Belgian Congo, 513

Smallpox—*cont.*
- Incidence—*cont.*
  - Brazil, **656**
  - British East Africa, 510
- in Monkeys, **656**
- Treatment, by Pot. permang., 656
- Vaccination: Reactions from, in Lepers, **485** *bis*
- Vaccine, and Neurotropic Ectodermoses, **680**

SPRUE, 416–17, 733–5
- Anaemia in, and in Pernicious Anaemia, **416**
- Blood Picture, **735**
- Diagnosis, 413
- Etiology: New Theory, **733**
- Incidence
  - Geographical
    - Bombay, 416
    - D.E.I., 413
    - Germany: Indigenous, 735
    - Korea, **416**
    - Porto Rico, 734
    - Queensland, 733
    - U.S.A.: North Carolina, 416
  - House, **416**
- *Monilia psilosis* Isolated from, 416, 734, 735
- Non-Tropical Case, **735**
- Personal Experience with, **733**
- Titles of Unnoticed Papers, 417, 735
- Treatment, Based on New Etiological Theory, **733**
- Tropical: Clinical Investigation, **734**

Syphilis
- Diagnosis and Treatment: Sachs-Georgi (and other) Reactions for, **515, 516, 517, 518,** 834
- Framboesiform [U.S.A.], **178**
- G.P.I. in Civilized and Uncivilized Communities, **51**
- Incidence
  - Congo, 517
  - Libya, **277**
  - Nigeria, 509
- Nervous, in Europeans due to Native African Virus, **30**
- Precipitation Tests, **911** *ter*
- Sero-Reaction by Levaditi's Test, **517**
- Sero-Reactions of, in Malaria, **975**
- Syphilides in Old Tattoo Marks, **850**
- Treatment: Recent Views on, **653**
  - Various Means
    - Antimony, 845
    - Arsphenamine: Effect on Cardio-Vascular Cases in Negroes, **653**
    - Bismuthosodium and Pot. Tartrate, 842

Syphilis—*cont.*
  Treatment—*cont.*
    Various means—*cont.*
      Novarsenobenzol, Hepatic Insufficiency with Icterus after, **654**
      " 189," in Tertiary Cases, **181**
      Trépol, **30**
  Unity or Duality of, 30
  Yaws and, **842**

TUBERCULOSIS IN THE TROPICS, 183–202, 990–1002
  Bacillaemia in Blacks, **995**
  Bacteriology
    B. tuberculosis in Culture: Properties of an Endolipase, **1000**
      Influence on, of Chaulmoogra Oil, **200**
  Breast, in Sudanese Woman, **194**
  Complement Fixation in, in relation to Malaria, **201**
  Cuti-Reaction: Various Places, **188** *bis*, **189, 193,** *table*, 192
  and Experimental Scurvy of Guinea-pig, **399**
  Human and Animal
    Dakar, **186, 187** *bis*, 188, **1001**
    India, 185
  Immunity Test, D.E.I., 21
  Incidence
    Age, **188,** 189
    Geographical
      Algeria, **189** *bis*
        Mecheria, **193**
        Saharan, Mzab, **996**
      Australia, 199
      Belgian Congo, 682
      Brazil
        Rio de Janeiro, **998**
        S. Paulo, **200, 999**
      British Guiana, **998**
      D.E.I., 21, 199, **996**
      Egypt, with Typhoid-like Pyrexia, **195**
      French Colonies, **184, 188–9**
      French Guinea, **188**
      India, **184,** 185, 199
      North African Oases, **193** *bis*
      Senegal, **186** *bis*, **187** *bis*, **188, 189**
      South Africa, **195, 198,** 199
        Transvaal, **990, 991**
      Sudan, **194**
      Tropics, **996**
    Race, 189, 191
      Black Races, **995**
      French Army of the Rhine, **993**
      French Colonial Troops, 993–4, **995**
      Native Miners: Transvaal, **990, 991**

Tuberculosis—*cont.*
  Incidence—*cont.*
    Race—*cont.*
      South African Natives, 199
        Report and Discussion, **195**
  Latent, 189, 191
  Miner's Phthisis, 199, **990, 991**
    Mortality, **195**
    Silicosis and, and Medical Inspection, **199**
  Prophylaxis, **189, 200**
    British Guiana, **998**
    Dispensaries, **998, 999**
    in reference to French Colonial Troops, **995**
    Sanatoria and Clinics, **198**
  Phthisis and, **202**
  Pulmonary: Problem of Tropical Medicine, **184**
  Spread: Methods of, **183**
  Simulated by *Monilia tropicalis* Infection, 50
  Titles of Unnoticed Papers, 1002
  Treatment
    in British Guiana, **998**
    Clinical Experience of, **999**
    Various Means of
      Chemotherapy, **1000**
      Coconut Oil, 511
      Sod. Morrhuate, 200–1, 511, 1000 *bis*
      Surgical, 189, 199
        and Sea Climate in the East, **199**
  Tuberculin Reactions
    Dakar, in Children, **188**
    French Guinea, **996**
    French West Africa, **189**
    Mzab, **996**
  Tuberculosis Schemes, Need for Research in Framing, **997**
  in Zebu: Dakar, 187, **1001**

Typhus Fever
  Diagnosis, **38,** 512
  Etiology; *Rickettsia* and, **660**
  Fevers resembling
    Annam, **807**
    Australia, **807** *bis*
  Friedberger's Reaction in, **39**
  Incidence
    Algeria, 39
      Oran, **37, 661**
    America, South, Biological Reactions, **36**
      U.S.: Boston, **38**
    Argentina, 662
    South Africa, 512
  Is it Heritable in Louse ? **37**
  " Microbion " of, **661**
  Organisms of, Cultivation of, **808**

Typhus Fever—*cont.*
- Pathogeny, **661**
- Prophylaxis
  - Anti-typhus Campaign, **662**
  - Simple Means of, **662**
- *Rickettsia* of, **423**
    - in Infected Lice, **37**
  - *prowazeki* and, **662, 663** *ter*
- Transmission by Lice, **37** *ter*
- Treatment by Pyotherapy, **39**
- Weil-Felix Reaction in, **38** *bis*

UNDULANT FEVER, 377–82, 803–4
- Associated Enteric Fever and, **379**
- *B. abortus* and *M. melitensis*, Relations of, **382, 803**
  - Non-Pathogenic to Man, **804**
- Incidence
  - A.-E. Sudan
    - Khartoum, **803**
      - Fatal Case, **378**
  - France, 381
    - [Marseilles] : Epidemic [at Air Station near], **379**
    - Paris, 381
  - Italy, 379
  - Lima, **380**
  - Malta, 377
  - Persia, 803
  - Russian Turkestan, **803**
  - South Africa, **377, 378,** 381
  - U.S.A., Southern States, **380**
- Mediterranean Fever or, **377**
- Prophylaxis [Goat Immunization], **381**
- Treatment by
  - Abscess of Fixation, 381
  - [Arsenicals], **381**
  - Autohaemotherapy : Cure, **381**
  - Lysed Vaccines, **906**

VERRUGA PERUANA, 810–11
- Diagnostic and Clinical Observations, **810**
- Mistaken Case, **811**
- Prophylaxis, **811**

YAWS, 169–82, 835–44
- Bordet-Wassermann, and Wassermann Reactions in, **177,** 512–13, **843**
- Cases of, **180** *bis*, **842**
- in Conjunction with, or preceding Goundou (*q.v.*), 35
- Diagnosis, 512
- Formol-gel and Hecht-Bauer Reactions in, **761**
- Framboesiform Syphilid, **842**
  - Syphilis, **178**
- Gangosa as caused by, **50**
- Healing : Histology, **836**
- Immunity in, **836**

Yaws—*cont.*
- Incidence
  - Age, 176, 180, 181
  - Geographical
    - Brazil, **841**
    - British East Africa, 182
    - Ceylon, 169
      - Kolonna, **841**
    - Congo, Belgian, **177,** 512–13, 682
      - French, **176**
    - Dominica, 836
    - Durban, 182
    - Formosa, **841**
    - Gaboon, **181**
    - Grenada, **843**
    - India : History of Introduction, **835**
    - Libya, **277**
    - Malaya, **182**
    - Manila, **175,** 836
    - Samoa, American, **179, 840**
    - Santo Domingo, **172, 174**
    - Togo, 180
    - U.S.A., **178**
    - West Indies, 3
- Investigations, **836**
- Juxta-Articular Nodules (*q.v.*) in, 170
- Parangi, **169**
- Prophylaxis, 3, **176**
  - Control : Summary, **836**
  - Home Visiting, 172
- Public Health Aspect, **836**
- Relation between, and Syphilis, 171, 178, **179,** 180, **842** *bis*
- Treatment, 3
  - Effect on Wassermann Reaction, **843**
  - Intensive : Grenada, **843**
  - Various Means
    - Antimony, **182, 842**
    - " Bi 36," **182**
    - Bismuthosodium and Pot. Tartrate, **842**
    - Neo-Arsphenamin, **175**
    - Novarsenobenzol, 177, **180** *bis*
      - in Enemata, 181
    - Novarsenobillon, 843
    - " 189," **181** *bis*
    - Sulfarsenol, **177, 180**

YELLOW FEVER, 144–7, 585–7, 882–3
- Cases Reported as, **146**
- Differential Diagnosis, **647**
- Disappearance from San Domingo, **585**
- Disease resembling
  - Bucaramanga, 911
  - Ivory Coast, **882**
- Etiology, **146**
- Exanthems, Acute, and **883** *bis*

Yellow Fever—*cont.*
  Experimental
    Blood Exam., **586**
    Hepatic Lesions, **586**
  Immunity-duration after Inoculation, **146**
  Incidence
    Brazil, **145** *bis*
    Grand Bassam, **882**
    Mexico, **585**
      Vera Cruz, 882
    Peru, **145**

Yellow Fever—*cont.*
  Incidence—*cont.*
    St. Thomas, **144**
  Prophylaxis
    Inoculation, **146** *bis*, **147**
    Stegomyia Indices: Value in, **586**
  Serological Reactions, **882**
  Spread of: Extract on, from Hirsch, 18
  Subtertian Malaria Simulating, 147
  Titles of Papers not, or briefly, Noticed, 147

TROPICAL DISEASES BUREAU.

JOURNALS.

NOTE.—The date and volume number following the title indicate the earliest volume of the series which the Bureau possesses. Dashes after the date and volume number indicate that the intervening parts (unless otherwise stated) are complete to the date of publication of this list.

Series which are complete from the commencement are italicised.

Some of the foreign journals are not up to date.

EUROPE.

GREAT BRITAIN AND IRELAND.

Annals of Tropical Medicine & Parasitology (Liverpool)	1907—	Vol.	1—	
British Journal of Ophthalmology (London)	1917–23	Vol.	1–7.	
British Medical Journal (London)	1876—			
Bulletin of Entomological Research (London)	1910—	Vol.	1—	
Department of Agriculture & Technical Instruction for Ireland Journal (Dublin)	1901—	Vol.	2—	
Ectoparasites (*London*)	1921—	Vol.	1—	
Edinburgh Medical Journal (Edinburgh)	1908—	(New ser.)		Vol. 1—
Glasgow Medical Journal (Glasgow)	1909—	Vol.	71—	
Journal of Comparative Pathology & Therapeutics (Edinburgh & London)	1908—	Vol.	21—	
Journal of Helminthology (London)	1923—	Vol.	1—	
Journal of Hygiene (Cambridge)	1901—	Vol.	1—	
Journal of the Ministry of Agriculture (London)	1913—	Vol.	20—	
Journal of Pathology & Bacteriology (Cambridge and Edinburgh)	1892—	Vol.	1—	
Journal of the Royal Army Medical Corps (London)	1903—	Vol.	1—	
Journal of the Royal Naval Medical Service (London)	1915—	Vol.	1—	
Journal of the Royal Sanitary Institute (London)	1922—	Vol.	42—	
Journal of State Medicine (London)	1913	Vol.	21—	
Journal of Tropical Medicine & Hygiene (London)	1898—	Vol.	1—	
Lancet (London)	1824–42	[Incomplete]		1843—
Lister Institute. Collected Papers (London)	1904—	Vol.	1—	
London School of Tropical Medicine. Collected Papers—				
(*a*) *Clinical & Pathological Papers*	1922—	Part	1—	
(*b*) *Papers from the Department of Helminthology*	1922—	Part	1—	
Medical Science. Abstracts and Reviews (London)	1919—	Vol.	1—	
Parasitology (Cambridge)	1908—	Vol.	1—	
Physiological Abstracts (London)	1922–23	Vol.	7.	
Proceedings of the Royal Society, Series B. (London)	1905—	Vol.	76—	
Proceedings of the Royal Society of Medicine (London)	1921—	Vol.	15—	

GREAT BRITAIN AND IRELAND—*cont.*

Public Health (London)	1908—	Vol. 22—
Reports of the Sleeping Sickness Commission of the Royal Society (London)	1903—	No. 1—
Review of Applied Entomology. Series A.: Agricultural. Series B.: Medical & Veterinary (London)	1913—	Vol. 1—
Review of Applied Mycology (Kew)	1922—	Vol. 1—
Surveyor & Municipal & County Engineer (London)	1922—	Vol. 62—
Transactions of the Royal Society of Tropical Medicine & Hygiene (London)	1907—	Vol. 1—
Veterinary Journal (London)	1909—	Vol. 65—
Veterinary News (London)	1910–21	Vol. 7–18
Veterinary Record (London)	1912—	Vol. 25—

AUSTRIA.

Mitteilungen des Volksgesundheitsamtes im Staatsamt für soziale Verwaltung (Vienna)	1920—	No. 1—
Wiener Klinische Wochenschrift (Vienna)	1913—	Vol. 26—

BELGIUM.

Annales de Médecine Vétérinaire (Ixelles-Brussels)	1913—	Vol. 62—
Annales de la Société Belge de Médecine Tropicale (Brussels)	1920—	Vol 1—
Archives Médicales Belges (Paris)	1917—	Vol. 70—
Bruxelles-Médical (Brussels)	1922—	Vol. 3—
Bulletin de l'Académie Royale de Médecine de Belgique (Brussels)	1908–19	(4 ser.) Vol 22–29
Bulletin Agricole du Congo Belge (London)	1915—	Vol. 6—
Etudes de Biologie Agricole (London)	1915–16	Nos. 1, 2, 4
International Record of Child Welfare Work (Bulletin International de la Protection de l'Enfance) (Brussels)	1923—	No. 18—

DENMARK.

Hospitalstidende (Copenhagen)	1921—	Vol. 64—

FRANCE.

Annales de l'Institut Pasteur (Paris)	1897—	Vol. 11—
Annales de Médecine et de Pharmacie Coloniales [formerly *Annales d'Hygiène et de Médecine Coloniales (Paris)*]	1898—	Vol. 1—
Annales de Parasitologie Humaine et Comparée (Paris)	1923—	Vol. 1—
Archives de Médecine et de Pharmacie Militaires (Paris)	1914—	Vol. 63—
Archives de Médecine et Pharmacie Navales (Paris)	1907—	Vol. 88—
Archives de Parasitologie (Paris)	1898–1919	Vol. 1–16
Bulletin de l'Académie de Médecine (Paris)	1917–21	Vol. 77–86
Bulletin de l'Institut Pasteur (Paris)	1903—	Vol. 1—
Bulletin de l'Office International d'Hygiène Publique (Paris)	1909—	Vol. 1—
Bulletin de la Société de Pathologie Exotique (Paris)	1908—	Vol. 1—
Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris (Paris)	1913—	(3 ser.) Vol. 29—

FRANCE—*cont.*

Caducée (Paris)	1913–19	Vol.	13–19
Comptes Rendus de la Société de Biologie (Paris)	1903—	Vol.	55—
Gazette des Hôpitaux Civils et Militaires (Paris)	1913—	[Vol.	86 incomplete]
Journal de Médecine de Bordeaux et de la Région du Sud-Ouest (Bordeaux)	1923—	Vol.	95—
Medical Bulletin (Paris), now *War Medicine*	1917—	Vol.	1—
Presse Médicale (Paris)	1915—	Vol.	23. 1917— Vol. 25—
Recueil de Médecine Vétérinaire (Alfort) (1909. Vol. 86.)	1913—	Vol.	90—
Revue de Médecine et d'Hygiène Tropicales (Paris)	1904—	Vol.	1—
Revue de Pathologie Comparée et d'Hygiène Générale (Paris)	1917—	Vol.	17—
Revue Générale de Médecine Vétérinaire (Alfort)	1913—	Vol.	21—
Revue Pratique des Maladies des Pays chauds (Paris)	1922—	Vol.	1—
Revue Vétérinaire (Toulouse)	1913—	Vol.	38—
War Medicine (Paris) formerly *Medical Bulletin*	1917–18	Vol.	1–2

GERMANY.

Arbeiten aus dem Reichsgesundheitsamte (Berlin)	1913—	Vol.	43—
Archiv für Protistenkunde (Jena)	1902–6	Vols.	1–7
	1907–12	Vols.	9–27
	1913—	Vol.	30—
Archiv für Schiffs- und Tropen-Hygiene [& Beihefte] (Leipzig)	1897—	Vol.	1—
Archiv für Wissenschaftliche und Praktische Tierheilkunde (Berlin)	1917—	Vol.	43—
Berliner Tierärztliche Wochenschrift	1914—	Vol.	30— [Incomplete]
Centralblatt für Bakteriologie (Jena) 1. Abteilung. Originale	1912—	Vol.	65—
Deutsche Medizinische Wochenschrift (Berlin)	1909—	Vol.	35—
Lepra (Leipzig)	1913–17	Vol	14–15
Mitteilungen d. Tierseuchenstelle d. Thuringischen Landesanstalt f. Viehversicherung	1922—	Vol.	2—
Münchener Medizinische Wochenschrift (Munich)	1914—	Vol.	61—
Zeitschrift für Hygiene und Infektionskrankheiten (Leipzig)	1912—	Vol.	72—
Zeitschrift für Infektionskrankheiten parasitäre Krankheiten und Hygiene der Haustiere (Berlin)	1917–20	Vol.	18–20
	1922—	Vol.	24—
Zeitschrift für Immunitätsforschung und Experimentelle Therapie (Jena) Originale	1908—	Vol.	1—

GREECE.

Grèce Médicale & Ἰατρικὴ Πρόοδος (Athens)	1912—	Vol.	14— [Incomplete]

HOLLAND.

Folia Microbiologica (Delft)	1912–19	Vols. 1–4	
Janus (Leyden)	1909—	Vol. 14—	
Mededeelingen van het Kolonial Instituut, Afdeeling Tropische Hygiene (Amsterdam)	1914—		
Tijdschrift voor Diergeneeskunde (s'Gravenhage)	1920—	Vol. 47—	
Tijdschrift voor Vergelijkende Geneeskunde, enz. (Leyden)	1922—	Vol. 7—	

ITALY.

Annali d'Igiene [formerly Annali d'Igiene Sperimentale] (Rome)	1912—	Vol. 22—	
Annali di Medicina Navale e Coloniale (Rome)	1908—	Anno 14—	
Archivio di Farmacologia Sperimentale e Scienze affini. (Rome)	1918—	Vol. 26—	
Annali della Stazione Sperimentale per le Malattie Infettive del Bestiame (Naples)	1911—	Vol. 1—	
Bollettino dell' Instituto Sieroterapico Milanese (Milan)	1917—	Vol. 1—	
Bollettino della Società Medico Chirurgica di Modena (Modena)	1914—	Vol. 16—	[Incomplete]
Clinica Veterinaria (Milan)	1913—	Vol. 36—	
Giornale di Clinica Medica (Parma)	1920—	Vol. 1—	
Giornale di Medicina Militaire (Rome)	1914—	Vol. 62—	
Giornale della R. Accademia di Medicina di Torino (Turin)	1912—	Vol. 75—	
Giornale della Reale Società Italiana d'Igiene (Milan)	1913—	Vol. 35—	
Haematologica (Naples)	1922—	Vol. 3—	
International Review of the Science & Practice of Agriculture (Rome)	1920—	Vol. 11—	
Malaria e Malattie dei Paesi Caldi (Rome)	1910–17	Vols. 1–8	[Vols. 1–3 incomplete]
Malariologia [formerly Propaganda Antimalarica] (Naples)	1911—	Vol. 4—	
Moderno Zooiatro (Bologna)			
Parte professionale	1913—	Vol. 2—	
Parte scientifica	1913—	Vol. 2—	
Nipiologia (Naples)	1919—	Vol. 5—	
Nuovo Ercolani (Milan)	1913—	Vol. 18—	
Pathologica (Genoa)	1908—	Vol. 1—	
Pediatria (Naples)	1913—	Vol. 21—	(Ser. 2. Vol. 77—)
Policlinico (Rome) Sez medica	1912—	Vol. 19—	
Sez pratica	1912—	Vol. 19—	
Rivista Critica di Clinica Medica (Florence)	1913—	Vol. 14—	
Rivista Pellagrologica Italiana (Florence)	1913—	Vol. 13—	No. 4—
Sperimentale (Florence)	1913—	Vol. 67—	

NORWAY.

Norsk Magazin for Laegevidenskaben (Christiania)	1921—	Vol. 82—	

POLAND.

Medycyna Doswiadczalna i spoleczna [formerly Przeglad Epidemjologiczny] (Warsaw)	1920—	Vol.	1—

PORTUGAL.

Arquivos de Higiene e Patologia Exoticas (Lisbon) [formerly Archivos, &c.] ..	1905—	Vol.	1—
Archivos do Instituto Bacteriologico Camara Pestana (Lisbon)	1906—	Vol.	1—
Bulletin de la Société Portugaise des Sciences Naturelles (Lisbon)	1907—	Vol.	1—
Medicina Contemporanea (Lisbon) ..	1913—	Vol.	31—

ROUMANIA.

Archivia Veterinara (Bucarest) ..	1920—	Vol.	14—
Bulletin et Mémoires de la Société Médicale des Hôpitaux de Bucarest ..	1919—	Vol.	1—

RUSSIA.

Revue de Microbiologie et d'Epidemiologie (Saratov)	1922—	Vol.	1—

SPAIN.

Archivos del Instituto Nacional de Higiene de Alfonso XIII (Madrid) ..	1922—	Vol.	1—	
Boletin del Instituto Nacional de Higiene de Alfonso XIII (Madrid) ..	1913–19	Vols.	9–15	
Revista Española de Medicina y Cirugia (Barcelona)	1918—	Vol.	1—	No
Revista de Higiene y Sanidad Pecuarias (Madrid)	1917—	Vol.	7—	
Revista Medica de Barcelona (Barcelona)	1924—	Vol.	1—	

SWEDEN.

Acta Medica Scandinavica (Stockholm)	1920—	Vol.	54—
Hygiea (Stockholm)	1920—	Vol.	82—
Skandinavisk Veterinär-Tijdskrift (Uppsala & Stockholm)	1911—	Vol.	1—

SWITZERLAND.

International Journal of Public Health (Geneva)	1920–21	Vols.	1–2
Schweizer Archiv für Tierheilkunde (Zurich)	1913—	Vol.	55—

TURKEY.

Bulletin Sanitaire de Constantinople [formerly *Bulletin de l'Administration Sanitaire des frontières*] *(Constantinople)*	1921–23	Nos.	1–20

AMERICA.

CANADA.

Canadian Medical Association Journal (Toronto)	1911—	Vol.	1—

CENTRAL AMERICA AND WEST INDIES.

Boletin de la Asociacion Médica de Puerto Rico (San Juan)	1914—	Vol.	10—
Jamaica Public Health Bulletin ..	1917—		

CENTRAL AMERICA AND WEST INDIES *cont.*

Monthly Reports of the Department of Health of the Panama Canal (Washington)	1907—		
Proceedings of the Medical Association of the Isthmian Canal Zone, formerly *Proceedings of the Canal Zone Medical Association (Mount Hope, C.Z.)*	1908—	Vol. 1—	

SOUTH AMERICA.

Amazonas Medico (Manaos)	1918—	Vol. 1—	
Anales del Departmento Nacional de Higiene (Buenos Aires)	1919—	Vol. 25—	
Anales de la Direccion de la Sanidad Nacional (Caracas)	1919—	Vol. 1—	
Anales de la Facultad de Medicina (Lima)	1918—	Vol. 1—	
Anales del Instituto Modelo de Clinica Médica (Buenos Aires)	1917—	Vol. 2—	
Annaes Paulistas de Medicina e Cirurgia (San Paulo)	1915—	Vol. 4—	No. 3—
Archivos Brasileiros de Medicina (Rio de Janeiro)	1911—	Vol. 1—	
Archivos da Escola Superior de Agricultura e Medicina Veterinaria (Pinheiro, E. do Rio.)	1917—	Vol. 1—	
Boletin de la Sociedade de Medicina e Cirurgia de S. Paulo (Brazil)	1919—	Vol. 2—(ser. 2)	No. 2—
Brazil Medico (Rio de Janeiro)	1909	Vol. 23—	
British Guiana Medical Annual	1890-92, 1894-1902, 906—		
Cronica Medica (Lima)	1913—	Vol. 30—	
Gaceta Medica de Caracas (Caracas)	1914—	Vol. 21—	
Gaceta Medica de Ciudad-Bolivar (Ciudad-Bolivar, Venezuela)	1920—	No. 67—	
Memorias do Instituto Butantan (S. Paulo)	1918—	Vol. 1—	
Memorias do Instituto Oswaldo Cruz (Rio de Janeiro-Manguinhos)	1909—	Vol. 1—	
Repertorio de Medicina y Cirugia (Bogota)	1914—	Vol. 6—	
Revista Clinica (Medellin, Colombia)	1916—	Vol. 1—	
Revista del Instituto Bacteriologico (Buenos Aires)	1918-19	Vols. 1-2 [Incomplete]	
Revista Medico-Cirurgia do Brazil (Rio de Janeiro)	1921—	Vol. 29—	
Revista de Veterinaria e Zootechnia (Rio de Janeiro)	1917—	Vol. 7—	
Revista Zootecnica (Buenos Aires)	1920—	Vol. 7	No. 84—
Saúde (Rio de Janeiro)	1919—	Vol. 2—	
Sciencia Medica. Revista Brasileira de Medicina e Sciencias Affins (Rio de Janeiro)	1923—	Vol. 1—	
Servico Sanitario do Estado de Sao Paulo	1918—	N.S. No. 1—	

UNITED STATES.

American Journal of Hygiene (Baltimore)	1921—	Vol. 1—	
American Journal of Tropical Medicine (Baltimore)	1921—	Vol. 1—	

UNITED STATES—*cont.*

American Journal of Veterinary Medicine (Chicago)	1913—	Vol. 8—
Archives of Dermatology & Syphilology [*formerly* Journal of Cutaneous Diseases including Syphilis] (New York)	1913—	Vol. 31—
Archives of Internal Medicine (*Chicago*)	1908—	Vol. 1—
Boston Medical & Surgical Journal (Boston)	1915—	Vol. 172—
Bureau of Animal Industry Bulletins (Washington)	1909—	[Incomplete]
Collected Reprints from the George Williams Hooper Foundation for Medical Research (Univ. of California)	1915—	Vol. 1—
Collected Studies from the Research Laboratory, Department of Health, City of New York	1906—	Vol. 1—
Cornell Veterinarian (Ithaca, N.Y.) ..	1917—	Vol. 7—
Experiment Station Records (Washington)	1921—	Vol. 44—
Hygienic Laboratory Bulletins (Washington)	1903—	[Incomplete]
Illinois Biological Monographs (*Urbana*)	1915—	Vol. 1—
Index Medicus (Washington)	1912–20	(2 ser.) Vol. 10–18
Journal of Agricultural Research (Washington)	1920—	Vol. 20—
Journal of the American Medical Association (Chicago)	1910—	Vol. 54—
Journal of the American Veterinary Medical Association	1917—	Vol. 51—
Journal of Economic Entomology (*Concord*)	1908—	Vol. 1—
Journal of Experimental Medicine (*New York*)	1896—	Vol. 1—
Journal of Industrial Hygiene & Abstract of Literature (Boston) ..	1922—	Vol. 3—
Journal of Infectious Diseases (*Chicago*)	1904—	Vol. 1—
Journal of Laboratory & Clinical Medicine (St. Louis)	1916—	Vol. 2—
Journal of Medical Research (Boston)	1919—	Vol. 41—
Journal of Parasitology (*Urbana*) ..	1914—	Vol. 1—
Journal of Sociologic Medicine (Easton)	1916–18	Vol. 17–19
Long Island Medical Journal	1919—	Vol. 13—
Medical Record (New York)	1914–22	Vols. 86–101
Military Surgeon (Washington) ..	1913—	Vol. 33—
Monographs of the Rockefeller Institute for Medical Research (New York) ..	1920—	No. 13—
New Orleans Medical & Surgical Journal (New Orleans)	1912—	Vol. 65—
New York Medical Journal (New York)	1910–20	Vols. 91–112
Proceedings of the New Jersey Mosquito Extermination Association ..	1914—	
Proceedings of the Society for Experimental Biology and Medicine (*New York*)	1903—	Vol. 1—
Proceedings of the United States National Museum (Washington) ..	1879—	Vol. 2— [Incomplete]
Public Health Bulletins (Washington)	1908—	[Incomplete]
Public Health Reports (Washington) ..	1909—	Vol. 24—

UNITED STATES—*cont.*

School of Hygiene & Public Health : Johns Hopkins University : Collected Papers (Baltimore)	1920—	Vol. 1—
Southern Medical Journal (Nashville, Tenn.)	(1911, 1912 incomplete) 1913—	Vol. 6—
Southwestern Medicine (El Paso, Texas)	1917—	Vol. 1—
Studies from the Rockefeller Institute for Medical Research. Reprints (New York)		
Texas State Journal of Medicine (Fort Worth)	1905-22	Vols. 1-18 [Incomplete]
United States Naval Medical Bulletin (Washington)	1909—	Vol. 3—
United States War Department Bulletin (Washington)	1913—	No. 1—
University of California (Berkeley) : Publications in Pathology	1903—	Vol. 1—
Publications in Zoology	1908—	Vol. 6—
University of Kansas : Science Bulletin (Lawrence)	1902—	Vol. 1—
Venereal Disease Information (Washington)	1923—	Vol. 4—

ASIA.

CHINA.

Bulletin Médical Franco-Chinois (Peking)	1920—	Vol. 1—
China Medical Journal (Shanghai)	1912—	Vol. 26—
Contributions from the Peking Union Medical College (Peking)	1921—	Vol. 1—
National Medical Journal of China (Shanghai)	1919—	Vol. 5—

EAST INDIAN ARCHIPELAGO.

Geneeskundig Tijdschrift voor Nederlandsch-Indië (Rijswijk-Batavia)	1901—	Vol. 41— [Incomplete]
Journal of the Philippine Islands Medical Association (Manila)	1921—	Vol. 1—
Mededeelingen van den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië (Batavia)	1912—	Vol. 1—
Mededeelingen uit het Geneeskundig Laboratorium te Weltevreden (Batavia)	1919—	3 Ser. A. No. 1—
Monthly Bulletin of the Philippine Health Service (Manila)	1921—	Vol. 1—
Nederlandsch-Indische Bladen voor Diergeneeskunde en Dierenteelt (Batavia)	1919—	Vol. 31—
Philippine Agricultural Review (Manila)	1916—	Vol. 9—
Philippine Journal of Science, formerly *Philippine Journal of Science. Section B. Philippine Journal of Tropical Medicine (Manila)*	1906—	Vol. 1—

EGYPT.

Magallah Tibbiah El Masriah (Cairo)	1923—	

INDIA.

Agricultural Research Institute, Pusa, Bulletins. (Calcutta)	1912—		[Incomplete]
Arquivos Indo-Portugueses de Medicina e Historia Natural (*Nova Goa*)	1921—	Vol. 1—	
Boletim Geral de Medicina e Farmacia (Nova Goa)	1919—	5 Ser.	No. 1—
Indian & Eastern Engineer (Calcutta)	1915—	Vol. 36—	
Indian Engineering (Calcutta)	1915—	Vol. 57—	No. 6—
Indian Journal of Medical Research (*Calcutta*)	1913—	Vol. 1—	
Indian Medical Gazette (Calcutta)	1889–1908	[Vols. 24 & 34 Incomplete]	
	1909—	Vol. 44—	
Journal of the Association of Medical Women in India (Delhi)	1923—	Vol. 11—	
Madras Veterinary Journal (Madras)	1919—	Vol. 1—	
Memoirs of the Department of Agriculture in India. (*Calcutta*)			
Bacteriological Series	1912—	Vol. 1—	
Veterinary Series	1913—	Vol. 1—	
Report of the Agricultural Research Institute and College, Pusa. (Calcutta)	1907—		[Inc

INDO-CHINA, AND FURTHER INDIA.

Annual Reports of the Institute for Medical Research, Kuala Lumpur, Federated Malay States. (Kuala Lumpur)	1912—		
Bulletin de la Société Médico-Chirurgicale de l'Indochine (Hanoi & Haiphong)	1910—	Vol. 1—	[Vol. 2 Incomplete]
Medical Journal of the Siamese Red Cross	1918—	Vol. 1—	
Studies from Institute for Medical Research, Federated Malay States (Singapore)	1901—	Vol. 1—	[Incomplete]
Transactions of the Malaya Branch of the British Medical Association (Singapore)	1923—		No. 9—

JAPAN.

Acta Scholae Medicinalis Universitatis Imperialis in Kioto (*Kioto*)	1916—	Vol. 1—	
Aichi Journal of Experimental Medici (*Nagoya*)	1923—	Vol. 1—	No. 1—
Japanese Journal of Medical Sciences. Abstracts (*Tokyo*)	1922—	Vol. 1—	
Japan Medical World (Tokyo)	1921—	Vol. 1—	
Japanische Zeitschrift für Dermatologie u. Urologie (Tokyo)	1917—	Vol. 17—	No. 7—
Jikwa Zasshi	1917–22		
Journal of the College of Agriculture, Imperial University of Tokyo (*Tokyo*)	1916—	Vol. 3—	
Journal of the Japanese Society of Veterinary Science	1922—	Vol. 1—	
Kitasato Archives of Experimental Medicine (*Tokyo*)	1917—	Vol. 1—	
Kyoto Igaku Zassi (Kyoto)	1917–21	Vols. 14–18	

Japan—*cont.*

Mitteilungen aus der medizinischen Fakultät der Kaiserlichen Kyushu-Universität (Fukuoka)	1917—	Vol. 3—
Mitteilungen aus der medizinischen Fakultät der Kaiserlichen Universität zu Tokyo (Tokio)	1911—	Vol. 10—
Mitteilungen ueber allgemeine Pathologie und pathologische Anatomie [formerly *Mitteilungen aus dem pathologischen Institut der Kaiserlichen Universität zu Sendai, Japan*]	1919—	Vol. 1—
Mitteilungen der Medizinischen Gesellschaft zu Tokio (Tokio)	1917–20	Vol. 31–34
Saikingaku Zasshi	1917–23	
Sei-i-Kwai Medical Journal (Tokio)	1913—	Vol. 32—
Taiwan Igakkai Zasshi	1917—	
Tokyoer Medizinische Wochenschrift (Tokyo)	1917—	No. 2046
Verhandlungen der Japanischen Pathologischen Gesellschaft (Tokyo)	1911—	Vol. 1—

AFRICA.

Archives de l'Institut Pasteur d'Algerie (Algiers)	1923—	Vol. 1—
Archives de l'Institut Pasteur de Tunis (Tunis)	1906—	Vol. 1—
Archives des Instituts Pasteur de l'Afrique du Nord (Algiers & Tunis)	1921–22	Vols. 1–2
Archivio Italiano di Scienze Mediche Coloniali (Tripoli)	1920—	Vol. 1—
Bulletin de la Société Medico-Chirurgicale française de l'Ouest-Africain (Dakar)	1919–21	Vols. 1–3
Bulletin de la Société Ophthalmologie d'Egypte	1912—	
Journal of the Department of Agriculture, Union of South Africa (Pretoria)	1921—	
Maroc-Médical (Casablanca)	1923—	No. 13—
Medical Journal of South Africa [formerly Transvaal Medical Journal] (Johannesburg)	1912—	Vol. 8—
Nyasaland Sleeping Sickness Diary (Zomba)	1908–15	No. 1–25
Proceedings of the Transvaal Mine Medical Officers' Association (Johannesburg)	1921—	Vol. 1—
Revista Médica de Angola (Loanda)	1921—	Vol. 1—
Rhodesia Agricultural Journal (Salisbury)	1915—	Vol. 12—
South African Institute for Medical Research (Publications)	1913—	Vol. 1—
South African Medical Record (Cape Town)	1910—	Vol. 8—

AUSTRALASIA.

Australia.

Australian Institute of Tropical Medicine. Collected Papers (Townsville)	1914—	No. 1—
Commonwealth of Australia Quarantine Service Publications (Melbourne)	1913—	No. 1—

AUSTRALIA—*cont.*

Health (*Melbourne*)	1923—	Vol.	1—	
Health Forum (*Sydney*)	1923—	Vol.	1—	
Medical Journal of Australia (*Sydney*)	1914—	Vol.	1—	
Queensland Agricultural Journal	1919—	Vol.	12—	
Records of the South Australian Museum	1918—	Vol.	1—	

NEW ZEALAND.

New Zealand Medical Journal (Wellington)	1913—	Vol.	12—	No. 45—

The Bureau possesses complete sets of the following TROPICAL JOURNALS WHICH HAVE CEASED PUBLICATION :—

American Journal of Tropical Diseases and Preventive Medicine (*New Orleans*)	1913–16	Vols.	1–3
American Society of Tropical Medicine (*Transactions*) (*New Orleans*)	1904–14	Vols.	1–9
Archives des Instituts Pasteur de l'Afrique du Nord (*Algiers & Tunis*).	1921–22	Vols.	1–2
Journal of the London School of Tropical Medicine (*London*)	1911–13	Vols.	1–2
Journal of Tropical Veterinary Science (*Calcutta*)	1906–12	Vols.	1–7
Kala Azar Bulletin (*London*)	1911–12	Nos.	1–3
Paludism (*Simla*)	1910–12	Nos.	1–5
Scientific Memoirs by Officers of the Medical & Sanitary Departments of the Government of India (*Calcutta*)	1902–13 (New ser.)	Nos.	1–60
Sleeping Sickness Bulletin (*London*)	1908–12	Vols.	1–4
Yellow Fever Bureau Bulletin (*Liverpool*)	1911–15	Vols.	1–3

NOTE.—The Director would consider proposals for the exchange of the Bureau publications with other medical and scientific journals in which original papers on tropical diseases or parasitology are published.

I. A. R. I. 75

IMPERIAL AGRICULTURAL RESEARCH
INSTITUTE LIBRARY
NEW DELHI.

Date of issue.	Date of issue.	Date of issue.